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EAST ENGINEERING

October 9, 1950

STEEL

The Magazine of Metalworking and Metalproducing

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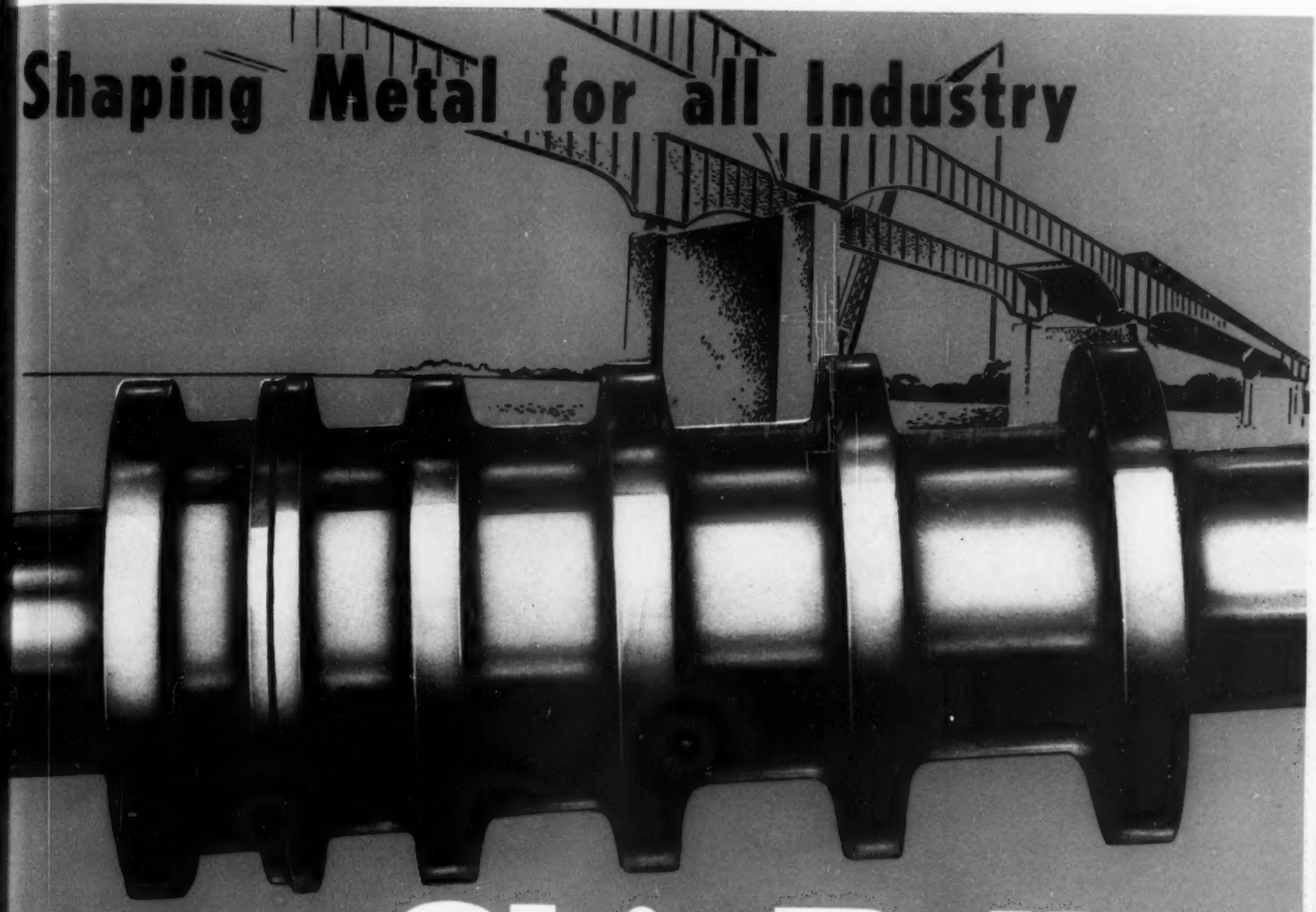


Ohio Rolls

Select from any of these eleven types of Ohio Steel and Iron Rolls:

Carbon Steel Rolls
Ohioloy Rolls
Ohioloy "K" Rolls
Holl-O-Cast Rolls
Chilled Iron Rolls
Dense Iron Rolls
Nickel Grain Rolls
Special Iron Rolls
Nioloy Rolls
Flintuff Rolls
Alloy Chilled Iron Rolls

THE OHIO STEEL FOUNDRY COMPANY

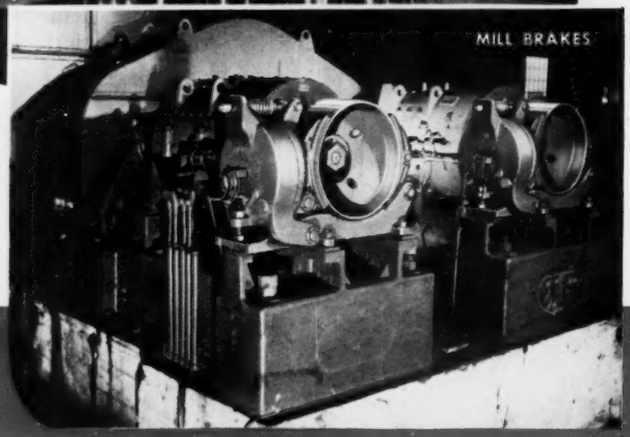
EC&M MOTOR CONTROL

HELPS KEEP STEEL PRODUCTION UP!

Short-throw EC&M Bulletin 1190 Master Switches are easy on operators—reduce fatigue. The 7-inch diameter cams minimize handle-throw from "off" to "full-speed" in each direction. Note, too, how the narrow-width permits convenient grouping —easy to reach.

TIME-CURRENT Acceleration speeds Mill Auxiliaries—allows motors longer time to get under way when mills are cold—automatically shortens acceleration time as the mill warms up. Mills equipped with EC&M Bulletin 925 Controllers *continue to set production records.*

Quick responding brakes—only the armature moves in EC&M Bulletin 1004 Type WB Brakes. Thick, tough brake blocks give long wear. These *long-life* brakes are available for both AC and DC motors.

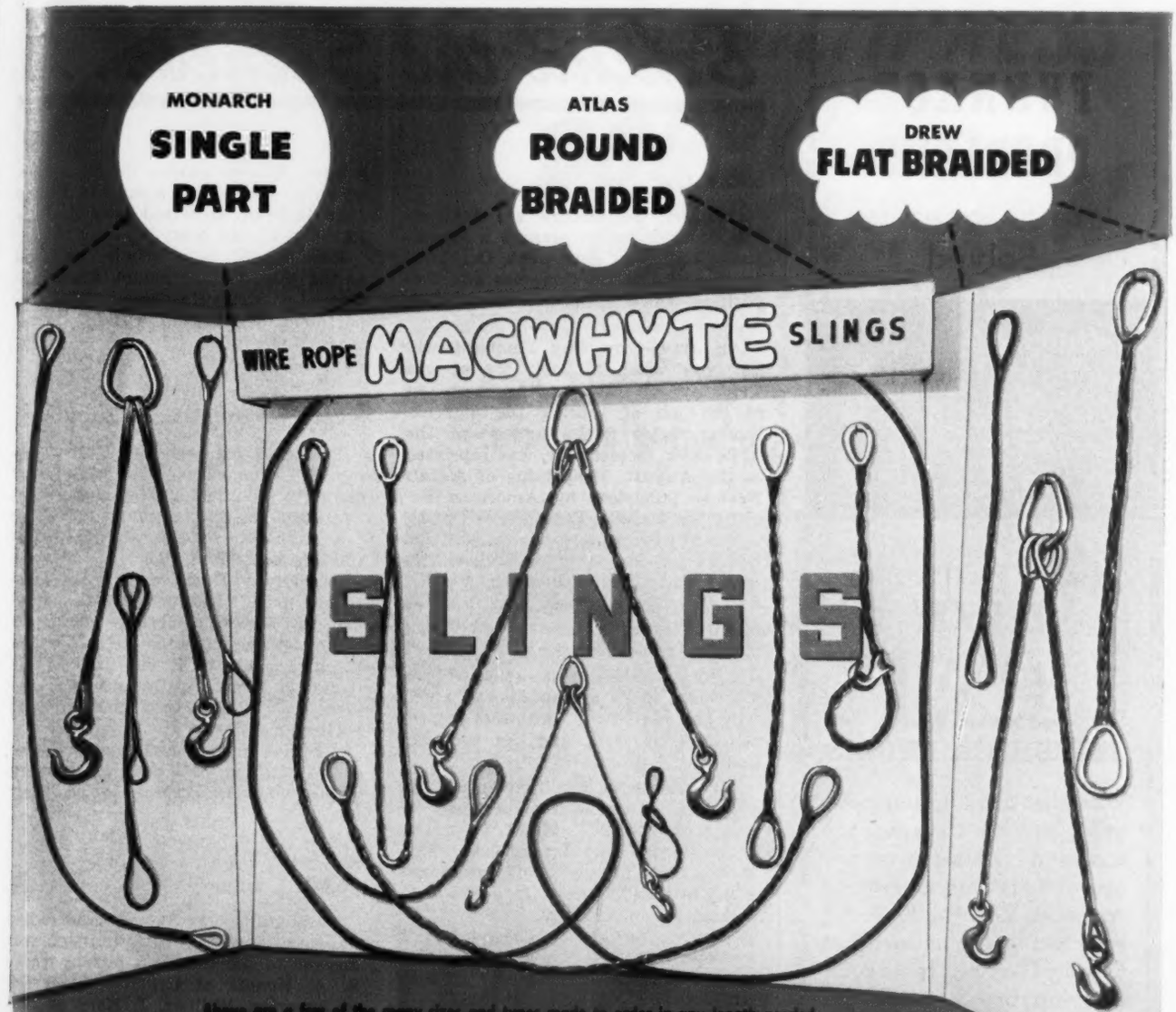


O. H. STOCKYARD MAGNET

The EC&M ALL-WELDED Lifting Magnet provides a better proportion and use of coil space, giving FULL LOADS of light scrap, as shown above.

THE ELECTRIC CONTROLLER & MFG. CO.

2698 East 79th Street Cleveland 4, Ohio



Above are a few of the many sizes and types made to order in any length needed.

There's a Macwhyte Sling that's the right sling

for safe handling with maximum efficiency and economy

Handling materials is easy when you have Macwhyte Slings made special to your needs. Call your Macwhyte Distributor or write direct to Macwhyte Company.

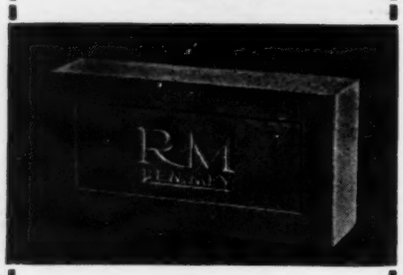
For cranes and hoists use PREformed MONARCH WHYTE STRAND CRANE ROPE made by MACWHYTE Company

MACWHYTE COMPANY
2912 Fourteenth Avenue, Kenosha, Wisconsin

Member National Safety Council

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cable and Assemblies, Stainless Steel and Monel Metal Wire Ropes. Catalog on request. Macwhyte distributors throughout the U.S.A. and other countries. Mill depots in the following cities: New York, Pittsburgh, Chicago, Minneapolis, Fort Worth, Portland, Seattle, San Francisco, Los Angeles.

FURNACE PROBLEMS
are Frequently Solved



by REMMEY
RM
SEMISILICA BRICKS

When heating furnace roofs, open hearth regenerator roofs and hot blast stoves are operating in the temperature range of 2200F.-2700F. for sufficient time to cause "First Quality Clay Bricks" to spall and vitrify or sag—and where the performance of silica bricks is hindered by shutdowns and severe temperature changes, a need is created for REMMEY RM Semisilica bricks.

If your furnace problem falls in this category, Semisilica bricks are the answer . . . specify REMMEY RM Brand SEMISILICAS.

REMMEY

Dependable Refractories

RICHARD C. REMMEY SON CO.
Philadelphia 37, Pennsylvania

Behind the Scenes . . .

Short Cut

Upstairs the editors are burning the midnight oil to prepare a special issue—to appear next week, Oct. 16—on the 1950 Metal Congress and Exposition which opens in Chicago Oct. 23.

An article by Guy Hubbard will tell you what to look for at the show so you can get the most out of the job of touring the 350 exhibits. Guy's STEEL article on the 1949 show, incidentally, was reprinted in the August, 1950, issue of *Metals Review* published by American Society for Metals. Reprints are being included with all advance registration badges for the show, as well as being mailed to all exhibitors.

Art Allen is working on a story for the issue on research and what it means to metalworking.

Also published next week will be a "Who's Who at the Show" which will list exhibitors, exhibitors' representatives present and the products and processes shown.

No one visitor can take in all the technical sessions and meetings at the show. STEEL's Metal Congress, program will help you choose which of the 200 papers being presented you will want to hear. In addition to the technical meetings, there will be a seminar on atomic energy and a business forum at which outstanding leaders in metalworking will tell how business is likely to be affected by a fractional war economy. Editor-in-Chief Earl Shaner is in charge of forum arrangements.

Coal Burner in the Skies

A gentleman debarked from a Pan American World Airways plane assisted by a sympathetic stewardess. The two hurried to the airport terminal and the first aid room. There, an attendant gently removed a sizeable cinder from the passenger's eye.

"First coal-burning airplane I ever flew in," said the traveler.

D Day Again

On page 61 this week is the fifth in STEEL's series on depreciation and re-equipment reform. This one gives the results of a survey by this magazine on metalworking's re-equipment policies. Earlier stories in the series, which is written by Associate Editor John Morgan, appeared May 8, June 19, July 31 and Aug. 21.

Reprints of this article, as well as the Aug. 21 installment, are available. Just write Readers' Service Department, STEEL, Penton Bldg., Cleveland 13, O.

Shame on You, Union Carbide

Russia is unhappy with Union Carbide & Carbon Corp. The Soviets lay claim to another of the world's inventions—this time automatic welding—and charge that mean old Union Carbide won't admit it.

One Dmitri Dulchevsky in the Moscow journal, *Vestnick Machinostoyenia* (Engineering Herald), claims he is one of the inventors of automatic welding. He declares that many American firms use inventions of Soviet experts and pass them off as their own.

Another invention claimed by Russia is printing. No doubt Gutenberg was a "Soviet expert" of an early era.

Puzzle Corner

Diophantus was 84 years old when he died. First in with that correct answer to the Sept. 25 puzzle were: S. A. Kenorf of Crucible Steel Co. of America, William J. Kerr of National Tube Co., M. S. Bailey of Machine Products Corp., C. E. Blass of Talon Inc. and J. Claghorn and W. Scharf of Fisher Body Division, General Motors Corp.

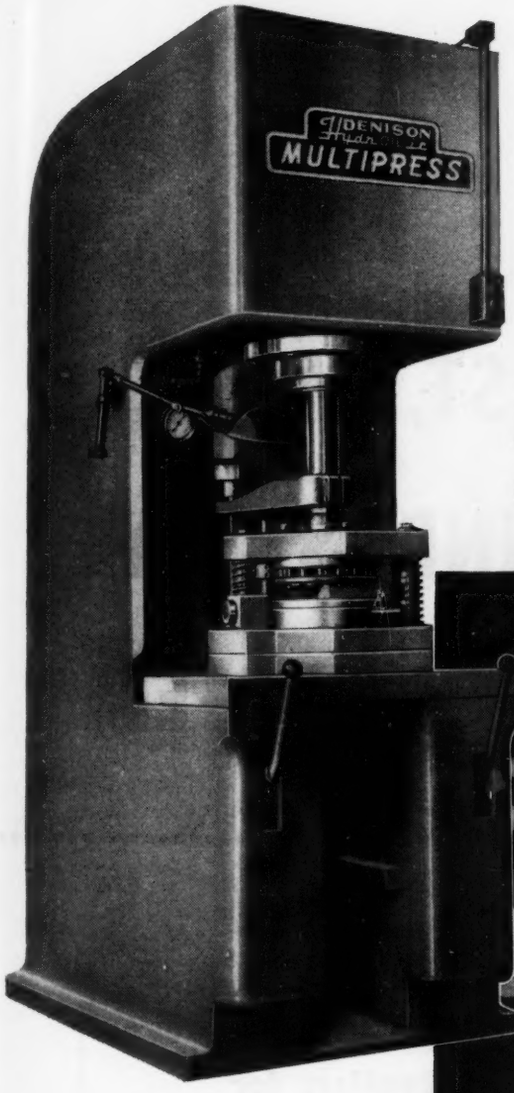
Here's one for you puzzle addicts with a literary bent. Fill in the blanks in this jingle with four-letter words, all of which are spelled with the same four letters:

A —— old woman
On —— bent
Put on her ——
And away she went.
"——, my son,"
She was heard to say,
"What shall we do
To —— today?"

Shrdlu

(Editorial Index—page 43)

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.

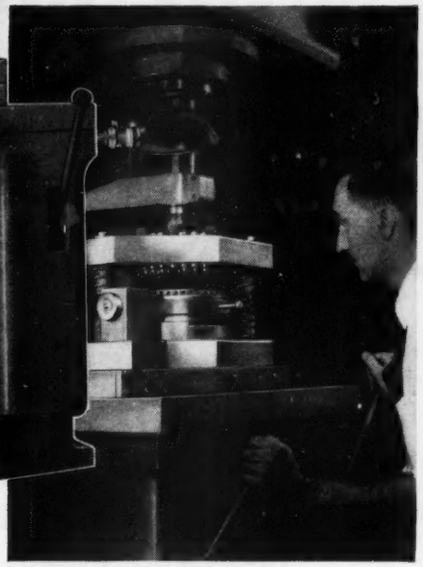


35-ton MULTIPRESS®

DOUBLES PRODUCTION

On Riveting Job

Also eliminates need for inspection . . . cuts straightening needs . . . ends rejects



Close-up of Multipress and the special ram tooling about to process 18 rivets at a single stroke.

Special press tooling rotates and pivots for easy loading of assembly with loose rivets in place.

THE 35-TON MULTIPRESS above handles a tricky riveting job for Harley-Davidson Motor Company, Milwaukee, *twice as fast as the previous equipment!* Along with this phenomenal gain in production, rejects have been cut to near zero . . . straightening of finished units has been slashed 89 per cent . . . inspection of riveted assemblies is no longer necessary . . . and the riveting itself is done better than ever before!

With Multipress, one downward sweep of the ram processes up to 18 rivets in wheel-sprocket and brake-hub assemblies. Each rivet gets uniform pressure, smoothly and accurately applied. Correct alignment of parts is automatic. Rejects dropped to less than ½ of one per cent. In addition, press tooling and fixtures can be changed in a few minutes to any of several similar riveting jobs.

The compact, space-saving model L Multipress delivers up to 35 tons of smooth oil-hydraulic power at ram speeds up to 530 inches per minute. It offers a choice of quick, easy manual control of ram action, or completely automatic control. Stroke length is infinitely variable up to 15 inches. Ram speed, pressure and stroke-length can be preset quickly for a wide range of precision needs.

Among the many standard Multipress accessories available are six and 12-station indexing tables. They assure fast, safe feeding of work to the press ram, and facilitate the use of automatic loading and ejection equipment. Other production boosting Multipress accessories include equipment for pelleting, straightening, coining, high-speed feeding of continuous metal strip, and many others. Multipress is available in many sizes, with capacities from 1 ton through the 35-ton range. Write today for full details.

DENISON HydrOILics

The DENISON Engineering Co.

1163 Dublin Road **Columbus 16, Ohio**

WORLD'S FINEST, MOST ECONOMICAL INDUSTRIAL COMMUNICATION SYSTEM

FREE—4 Useful Booklets for Industrial Executives

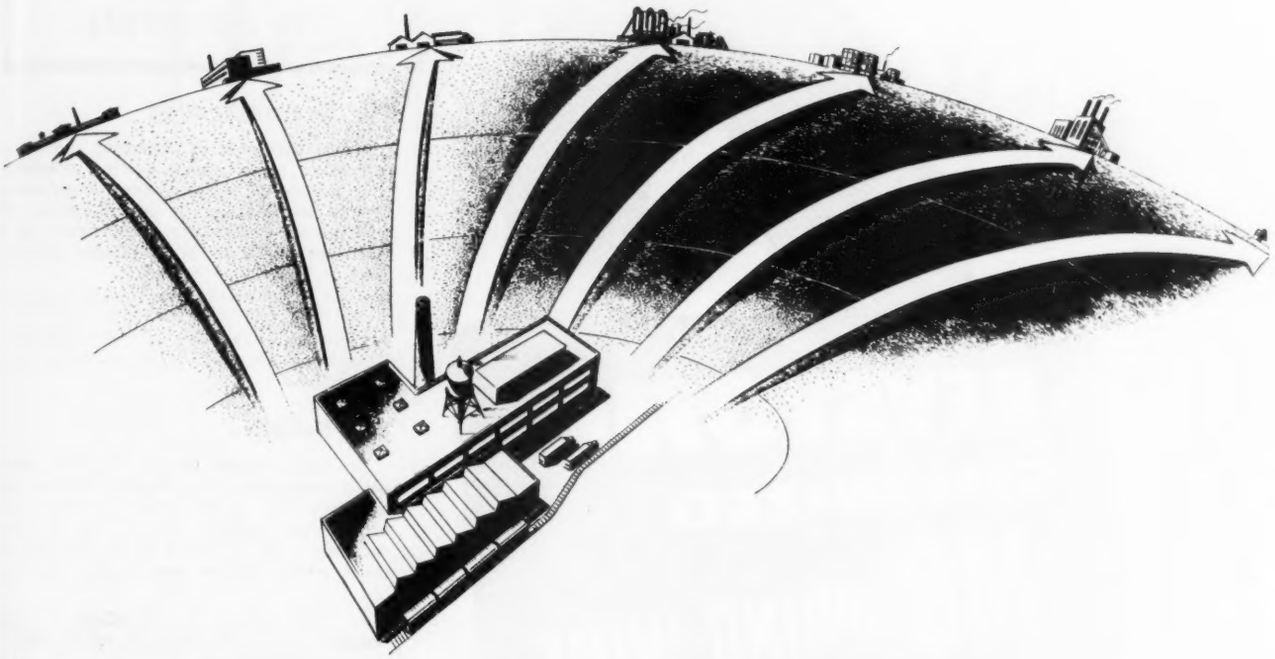
1. "How Industrial Advertising Meets the Demands of Top Management" and

2. "How Industrial Advertising Helps Make Sales"—Each describes 10 performance-facts reports from the advertising-sales records of such companies as E. I. du Pont de Nemours & Co., General Electric Company, Hercules Powder Company, Westinghouse Electric Corporation, Koppers Co., Inc., Standard Conveyor Co. Each tells how a sales situation was analyzed—how advertising was used in these situations, and what results were obtained.

3. "Copy That Clicks"—This is not just about advertising copy. Contains 20 examples that will give you a new viewpoint on advertising objectives; will help your advertising people do a better job.

4. "Mechanized Selling at Work"—Prepared for executives who would like to apply the same concrete, mathematical principles of efficient product production to the improved efficiency of order production.

Write to National Industrial Advertisers Association, 1776 Broadway, New York 19, N. Y. for these useful booklets. They're free.



....are you making the most of it?

That's all industrial advertising is, when you come down to it—an efficient, high speed, *low cost* means of telling busy, hard-to-get-at people in industry the things about your products or services you wish you could tell them person-to-person.

And don't let anybody tell you that your customers and prospects are not eager for this information—that they get too much of it already from your competitors. They want it, depend on it to do their jobs and earn their pay. They're actively looking for products and services that will help them to turn out better work and more of it at lower cost. They simply cannot do without the information that is industrial advertising.

- **Are they doing without it in the case of *your* products or services?**
- **Are your prospects getting too little information too late?**
- **Are you telling the story only to that limited portion of companies and individuals-per-company that can be reached slowly and at high cost per call by salesmen?**

Better take another look at the industrial advertising communications system and how well you're using it.

* * * *

• This message—one of a series by members of the National Industrial Advertisers Association—is published by STEEL *to create a wider understanding of industrial advertising and the contribution it is making to American industry.. Reprints of this message are available in limited quantities. Address:* STEEL, *Readers Service Dept., Penton Building, Cleveland 13, Ohio.*

Technical Advertising Association, Boston

A CHAPTER OF THE NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION

A national organization, comprised of 3,500 members of the 34 local associations of industrial advertising and sales executives—dedicated to greater efficiency in industrial distribution—and lower sales cost.

● **Corrosion resistant** ● **Extra strength**
● **Shiny smooth finish** ● **Uniform temper**

KEYSTONE'S GALVANIZED MB WIRE offers improved corrosion resistance . . . gives added life and strength to mechanical springs subject to rust and corrosive conditions.

This is due to Keystone's unique method of galvanizing the wire *before* it is cold-drawn. The drawing process smooths and hardens the galvanized finish, increasing its lasting qualities remarkably. Other advantages are its lustre-bright, shiny smooth finish . . . even, uniform temper . . . and high tensile strength.

Keystone is prepared to help solve any of your industrial wire problems. If special treatment is called for, Keystone's metallurgical research and testing facilities are available to supply the answers. We welcome your inquiry.

KEYSTONE
STEEL & WIRE CO.
SPECIAL ANALYSIS WIRE SETTING NEW STANDARDS OF PERFORMANCE
PEORIA ILLINOIS

LETTERS
TO THE EDITORS

For Grease Testing

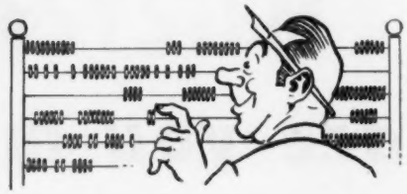
I am interested in obtaining more information on a grease testing machine that simulated actual service conditions over a wide range of temperatures. It was mentioned under Production and Engineering News at a Glance in the Sept. 4 issue.

W. R. Johnson, Research Metallurgist
Armour Research Foundation, Chicago, Ill.

● *Contact Texas Co., 135 E. 42nd St., New York 17, N. Y., for additional information.*

Not Satisfied

We run a small electric furnace steel plant producing steel ingots from scrap and are not quite satisfied with our accounting system as set up at the moment. As this is a new industry in these parts and we are unable to con-



tact any other firm with a like product, could you put us in touch with anyone who would give us a simple accounting and cost system to install?

Name Withheld upon Request

● *One of the best sources of data is the Proceedings of the Electric Furnace Committee, Iron and Steel Division, American Institute of Mining and Metallurgical Engineers, 29 W. 39th St., New York 18, N. Y. Costs rank high on the list of subjects discussed at conferences of this group; papers and discussions are available in printed form at nominal cost.*

You Want a Handbook?

I have read with great interest your feature, "Mirrors of Motordom", in STEEL. In the Sept. 11 issue you mention the 30th edition of the handbook *Automobile Facts and Figures*, issued by the Automobile Manufacturers' Association. Could you advise where one of these handbooks can be obtained?

C. H. Groom, Development Engineer
Dowell Inc., Tulsa, Okla.

● *Write to AMA, New Center Bldg., Detroit 2, Mich.*

Out of Print Dept.

I have been able to borrow an old copy of your reprinted articles, "The Plastic Forming of Metals," by Prof. Siebel and translated by John H. Hitchcock, which were from STEEL, Oct. 16, 1933-May 7, 1934. Is this booklet still available? I would be interested in securing reprints.

F. C. Reece, Project Engineer
Pennsylvania State College, State College, Pa.

● *The booklet is out of print. You could have additional copies made by the offset process, giving proper credit.*

HIGH PRODUCTION *in an* EMERGENCY

THE METAL INDUSTRY is awake to the need for increased production. It will meet the challenge as it has done in the past.

The 32nd Annual National Metal Congress and Exposition comes at a most appropriate time. At this all-important meeting of the top management, production and engineering talent in the industry, more than 30,000 will be in attendance.

If you haven't already planned to be in Chicago for the Metal Congress and Exposition—do so NOW! You will gain much by meeting people in the industry with similar problems—by seeing first hand what's new and improved to aid you in increasing your production.

This will be one of the most important meetings in the history of the metal industry. Top management men will be able to meet and talk to others—to compare notes, and to gather helpful information that would take weeks to secure in any other manner. And that goes for production men—department managers, supervisors, superintendents and foremen. All will be looking and listening—to get as much information as possible in a short space of time. And time is important right now. Engineers and metallurgists will be there to see what's new in equipment and processes, to examine and learn about structure and properties of new materials, that will fit into their operations and enable them to quickly step up production.

There will be about 400 firms displaying their products and services, with trained men in attendance to answer your questions and explain how they can help you achieve HIGH PRODUCTION.

Four great societies sponsor and participate in the Metal Congress and Exposition.

The American Welding Society will hold technical sessions at the Sherman Hotel, Monday through Friday.

The Institute of Metals Division of A.I.M.E. will hold technical sessions Tuesday, Wednesday and Thursday at the Sheraton Hotel.

The Society for Non-Destructive Testing will hold technical sessions on Tuesday, Wednesday and Thursday at the Morrison Hotel.

The American Society for Metals has a full week —Saturday through Friday—of technical sessions to be held at the Palmer House. "High Production" Sessions will be held at The Amphitheatre. If you would like a complete program of the Metal Congress, write American Society for Metals, 7301 Euclid Avenue, Cleveland 3, Ohio.

Chicago is centrally located and within reach of the entire metal industry. Plan now to attend this great meeting. There are ample hotel accommodations—write Chicago Convention Bureau, Inc., 33 N. LaSalle Street, Chicago 2, Ill.

Attend the Metal Congress and Exposition and you'll take back information that will enable you to do your job better and help your company do its share in this emergency.

This is another of the "HUNDREDS OF JOBS" which can be done on a MARVEL Band Saw!

MARVEL BAND SAW saved these two 4400 lb. castings

Two sand cores washed out when these giant 4400 pound steel connecting rods were cast, resulting in solid eye ends without gaps. Then came the $64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco, did this "impossible" job easily, quickly and economically, without special tooling, on a standard Model #8M/2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of $3.06 per rod. The tool was a MARVEL B9-10 Band Saw Blade.

Every tool room, machine shop and maintenance department needs a MARVEL Series 8 Universal Band Saw—not only for innumerable everyday jobs but for the occasional "trick" operations, where its utmost versatility will save many headaches and dollars.

WRITE FOR CATALOG

MARVEL Metal Cutting SAWS
Better Machines-Better Blades

These exclusive MARVEL Features made this job easy.

1. Large, T-slotted work table.
2. Blade feeds into work vertically; work always stationary.
3. Power-pressure feed.
4. Automatic Blade tension.
5. Built-in coolant system.
6. Large capacity.

ARMSTRONG-BLUM MFG. CO.

5700 BLOOMINGDALE AVENUE **CHICAGO 39, ILLINOIS**

see our CATALOG in SWEET'S FILE

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STEEL

The Magazine of Metalworking and Metalproducing

VOL. 127 NO. 15 OCTOBER 9, 1950

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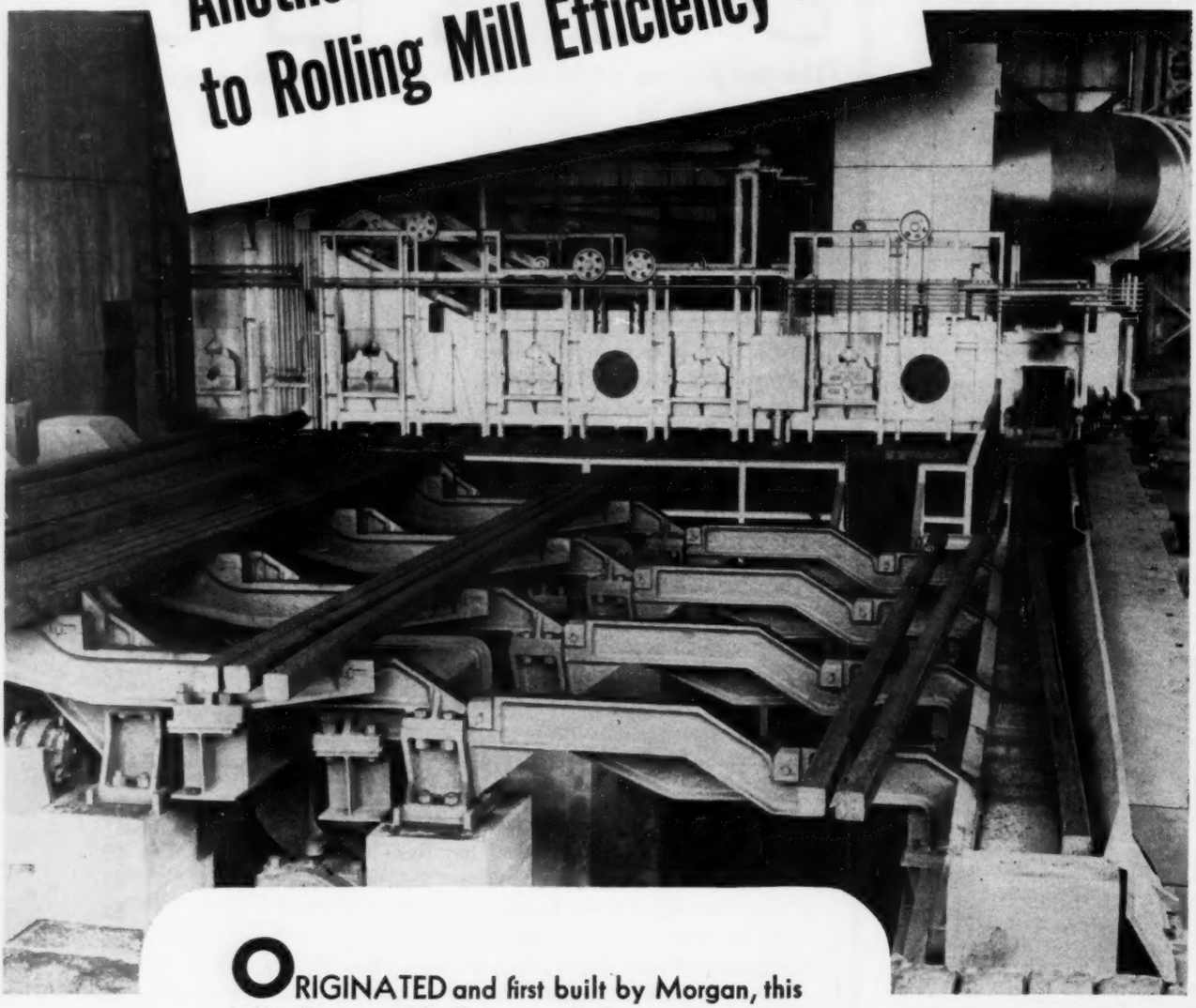
Next Week ... **Self-Regulating Chromium Bath Plates 20 to 80% Faster ... Different Metal Thicknesses Welded in One Handling ... NATIONAL METAL SHOW SECTION: Research Today for Tomorrow's Profits ... What To Look for at the Show ... Programs ... Products To Be Exhibited and Personnel Attending**

Another Morgan Contribution to Rolling Mill Efficiency . . .



ORIGINATED and first built by Morgan, this billet "unscrambler" is one of the interesting innovations in the Colorado Fuel and Iron Corporation's new Morgan 3-strand rod mill at Pueblo, Colorado.

These billet and slab separating skids—with the furnace charging conveyor, the ram type charger and furnace cross pusher—are operated in complete safety by one man. For the current high tonnage demands, these mechanical skids can handle billets and slabs at rates up to 200 tons per hour.

If you have a rolling mill problem that needs "unscrambling" why not discuss it with our engineers?

MORGAN CONSTRUCTION CO.

WORCESTER, MASSACHUSETTS

English Rep., International Construction Co., 56 Kingsway, London W. C. 2, Eng.

RM-33

MORGAN
WORCESTER

ROLLING MILLS · MORGOIL BEARINGS
WIRE MILLS · GAS PRODUCERS · AIR EJECTORS
REGENERATIVE FURNACE CONTROL

October 9, 1950

More Directives Coming

An important problem facing the National Production Authority is to determine correctly the extent to which government controls will be necessary to insure an adequate flow of materials to defense work. The task is difficult because conditions now existing or likely to prevail in the near future are different than at any previous time when controls were applied.

In October, 1940, more than a year before this country got into World War II, a priorities board was formed to stiffen a voluntary allocation system which was proving to be inadequate. The board retained the voluntary features of the program, but issued a series of priority graduations such as A, A1, A2, etc. This didn't work too well and was supplanted by direct allocations. When the Japs attacked Pearl Harbor on Dec. 7, 1941, and we were actually in a hot war, the old system was scrapped and the government relied upon straight mandatory allocations to procure needed materials.

Today we are starting out about as tentatively as we did in 1940. Regulation 1 on excess inventories, issued by NPA in September, was a mild gesture of little importance. Regulation 2, which went into effect Oct. 3, prescribes a single priority rating on existing and future contracts with the Defense Department and the Atomic Energy Commission. The rating can be used by the contractor to procure materials he needs to fulfill his contract.

The big question in the minds of many persons in industry and government is whether this simple system will prove adequate. Regulation 2 does not cover materials for freight cars, pipe lines and other nonmilitary items, some of which may be as important to the defense program as guns or tanks. Will it be possible to maintain a flow of materials to all essential activities—military or nonmilitary—to permit the proper balance of production without invoking more elaborate controls? NPA Administrator William H. Harrison hints that more directives may be expected. Many industrialists are of the opinion that a more realistic system will become necessary if the proposed defense program is to be carried out as planned. Under these circumstances, executives of most metalworking companies will do well to prepare themselves for another siege of directives from Washington.

* * *

ALERT AND FLEXIBLE: Ever since the Red invasion of Korea, American industry has been reappraising prospects for the future. Its leaders have weighed the possibility of a national pattern of crisis-upon-crisis in which a considerable portion of production would go into preparedness. Some of the cutbacks in civilian production necessitated by military requirements would build up a reservoir of peacetime demand to be satisfied only after the period of crisis had passed.

On the basis of this reasoning, many companies have revised their ideas as to prospects for the next decade. A few large companies can see nothing but unprecedented demand ahead. An excellent illustration is the attitude of steel producers. Prior to the Korean affair, they were aiming at a steel ingot capacity of around 105 million tons annually by the end of 1952. Last week, in conference with Secretary of Commerce Charles Sawyer, they presented figures which indicate that their recently re-

(OVER)

vised expansion plans will boost capacity to 109,963,000 net tons by the end of 1952.

This should be regarded as a tentative figure. If our expectation of a national routine of crisis plus crisis proves to be true, this goal will be exceeded. If by some miracle, the pressure for armament is relieved, the expansion program may be revised downward. The important point is that our steel industry, under the democratic capitalistic system, is sensitive to changing conditions.

Where else in the world and under what other system do you see such adaptability and flexibility? —p. 53

* * *

BEWARE OF FAKERY! Something weird and bizarre is likely to emerge from the present rat race toward inflation. Unions are seeking negotiations on wage rates in advance of the time their contracts call for such consideration. Some companies have agreed to "receive and consider" the unions' proposals, without waiving their rights or obligations under existing contracts.

One can almost assume that some increase will be granted. After all of the union applicants have received their advance, with government sanction, there will be a great hue and cry about prices. It will be said that the wage increases do not justify a price increase. Something resembling the admittedly phony arguments of former Secretary of Commerce Wallace may be introduced to try to prove that wage increases do not necessitate price increases. Be prepared to challenge this fakery! —p. 52

* * *

THREE GROUPS AGREE: In the fifth of a series of articles on the importance of realistic depreciation of plant and equipment, Associate Editor John S. Morgan draws interesting conclusions from the replies of 50 metalworking companies to his questions on re-equipment policies. As expected, a large percentage of the companies think that inadequate tax depreciation allowances retard the installation of needed equipment.

Encouraging is the fact that important elements in the industrial picture seem to be fully aware of the dangers of technological stagnation. Stockholders of 86.7 per cent of the companies reporting do not exert undue pressure for more dividends when money is needed for replacing equipment. Also, 70 per cent of the companies say their banks are sympathetic to re-equipment plans. Even more significant is the fact that 93.3 per cent of the companies say that "labor" (in most cases meaning a union) does not oppose equipment purchases that would increase production per man hour. —p. 61

* * *

NEW JOB FOR X-RAYS: When most persons think of the application of radiography to industrial problems they assume that its major service is in detecting internal flaws in metals. To date the x-ray has been used chiefly for this purpose, but it is capable of performing another service which in many cases could prove to be invaluable.

Eastman Kodak Co. cites a situation in which two of a group of complicated hydraulic mechanisms failed to function properly. To disassemble the entire installation would have been costly. Somebody suggested that x-rays be taken of the faulty mechanisms and that they be compared with x-rays of a properly functioning mechanism. This was done. Comparison of the prints showed that some compression springs were out of alignment and others were missing. No wonder these mechanisms didn't work!

It requires no great imagination to realize that this technique has great possibilities in diagnosing internal troubles in intricate mechanical installations without disassembling them. —p. 85

* * *

WAY TO SAVE MONEY: Application of power brushing to jobs where burrs, sharp edges, tool marks and metallic detritus must be removed may save money and improve the quality of work. A new operator working on a semi-automatic universal workpiece holder and brushing lathe setup was able to finish 200 gears per hour whereas a trained worker utilizing hand tools finished only 20 gears per hour. According to standards set by the machine-brushed gears, none of the 20 gears finished by hand would have passed inspection.

The work holder rotates the gear and presents it to the brush. The amount, direction and quality of brushing each gear receives can be controlled by preset timers. Once the machine is set up for a given job, the operator's duty consists solely of loading and unloading the work holder. All other operations can be predetermined and preset. Obviously mechanical brushing promises attractive cost-reducing possibilities on mass production work. —p. 80

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

FIRST STEP—National Production Authority's first major regulation—imposition of priorities on defense and Atomic Energy Commission orders—raises two questions: Will the priorities work? Will they lead to more widespread controls? (p. 51). Most metalworking people think the limited system will work under present circumstances because thus far industry voluntarily has been leaning over backwards to fill defense and AEC contracts. But industrialists also think priorities are a wedge that government can use to get tighter controls later on.

THE KIND OF CONTROLS—Most steel men are in favor of voluntary distribution controls (p. 51). At the organizational meeting of NPA's Steel Products Advisory Committee they held out for voluntary allocations in any nonmilitary programs needing steel, particularly for freight cars. They received assurances that no government orders are being considered now to curtail automobile or any other civilian production.

IN THE LONG RUN—The long-term steel supply situation looks good (p. 53). Secretary of Commerce Charles Sawyer says the nation's steelmaking potential will be increased by about 9.4 million tons by the end of 1952 to a total annual capacity of 109,963,000 net tons. Where are the expansions to be made? Sharon Steel Corp. is one company to expand, with a $49 million program (p. 53). U. S. Steel's Tennessee Coal, Iron & Railroad Co. will boost its yearly capacity from 2,850,000 to 3,350,000 tons (p. 54). Kaiser Steel Corp. will boost its annual capacity by 15 per cent (p. 54).

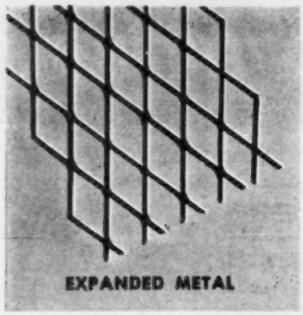
THE DOOR IS AJAR—The CIO's United Steelworkers has persuaded four steel companies to hear today, Oct. 9, why contract talks should be reopened before Nov. 1, the date set in the present agreements (p. 52). Republic, Jones & Laughlin, Youngstown and Inland will probably be told the workers need an across-the-board wage increase because of rising prices. The union will likely insist on a minimum boost of 15 cents an hour.

BIG SHIPBUILDING PROGRAM?—The U. S. has no plans for an immediate shipbuilding program, says the Maritime Administration (p. 56). MA denies reports that it will let contracts for 50 fast merchant vessels. What it is doing is this: Using regular research procedure in asking for bids on preparing working plans and specifications for a 20-knot merchant ship that could be the prototype for a new defense fleet. A lot of preliminary work is needed and hitches may develop before final plans are nailed down. Hence, the actual number of vessels to be built has not yet been decided upon.

IN A PICKLE—Metalworking's most pressing problem now is: How to hold off on price rises—and price controls—in the face of increasing wages (pp. 68-71). To solve the puzzle, industry must buck labor demands, inflationary policies of the government and the heady effects of a consumer credit which is at an all-time high of about $21 billion. Metalworking production continues a torrent. The daily average steel tonnage for September should be the highest ever recorded. The FRB industrial production index hit an estimated peak of 212 last month. It will be at least as high in October.

TWO ROADBLOCKS—The government's obsolete depreciation laws and industry's general lack of scientific replacement analysis are the two chief obstacles to good equipment replacement, a STEEL survey reveals (p. 61). Some 93.3 per cent of the companies responding to a questionnaire say labor opposes no equipment purchases that would mean more production per man hour.

HERE AND THERE IN INDUSTRY—Munitions Board is making progress in cataloging military items to simplify procurement (p. 55) . . . The job of organizing and manning the NPA proceeds (p. 57) . . . The U. S. in its new defense setup won't make as extensive use of dollar-a-year men as in World War II, but a few will still enter government service (p. 57) . . . Warehouse inventories have dropped 439,920 tons since September, 1949 (p. 55) . . . Fisher Body's new Pittsburgh plant will cut costs (p. 65) . . . Foreign currencies stabilize (p. 62).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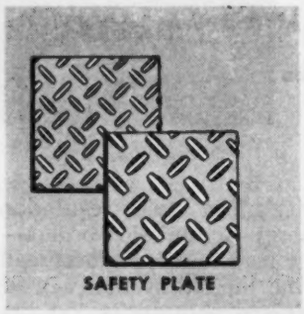
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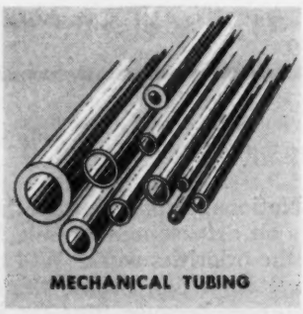
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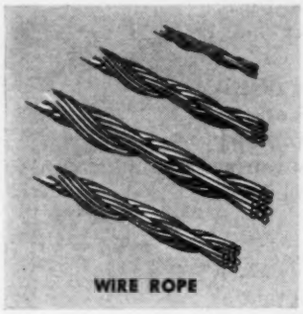
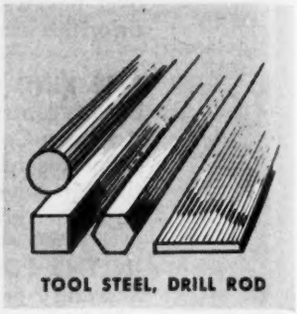
CARBON AND ALLOY CHAIN


WIRE ROPE

These Steel Products for Prompt Shipment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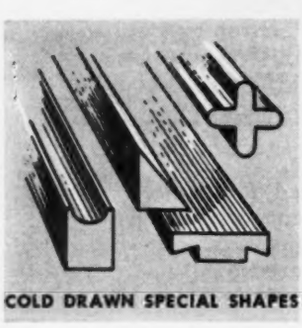
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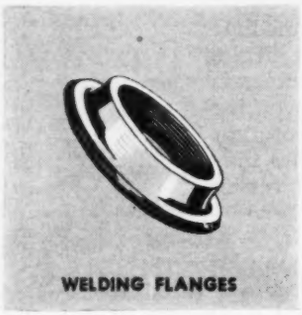
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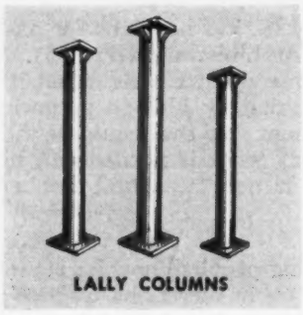
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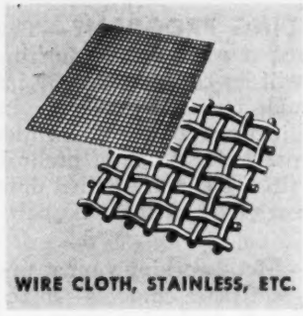
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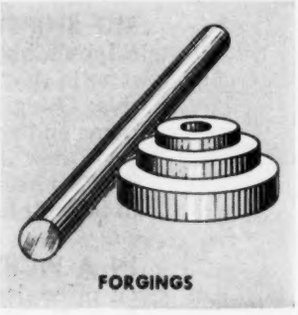
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STEEL
A PENTON PUBLICATION

NPA Gets in Gear with Priorities

The shape of the fractional war economy to come gets clearer as a limited priority system goes into effect for military and Atomic Energy Commission orders

THE OUTLINE of a fractional war economy grew clearer last week when the National Production Authority set up a limited priority system for metalworking.

NPA Administrator William H. Harrison hints that more directives are coming. The hint indicates that slowly increasing government controls on industry will be a major feature in the part war, part peace economy in the embryonic stage now that the Communists have been driven out of South Korea.

The Starch Didn't Work — NPA Regulation 2—Regulation 1 on "excess" inventories doesn't amount to much—comes just ten years after a major development in an earlier experiment with priorities. In October, 1940, a priorities board was formed to put starch in a limp voluntary program. The voluntary feature was kept, and the board struggled for months to give meaning to A, A1, A2 and AA priority gradations.

By June, 1941, even board members were admitting publicly that the system wouldn't work. From June on, the plan petered out, being replaced by allocations. Pearl Harbor on Dec. 7, 1941, cut the dog's tail completely off, and henceforth compulsory allocations were the major tool used by the government to get war goods.

Yes, Yes, Yes—Are we in for another evolution from limited priorities to widespread allocations? Many metalworking executives agree that the answer is "definitely yes" if we get into a full-scale war, "probably yes" if we have many more adventures like Korea and "possibly yes" if we continue in a state of armed truce for many years.

The priority order, which went into effect Oct. 3, prescribes a single "rating" which the Defense Department and the Atomic Energy Commission can use to force most producers of raw materials and manufacturers of finished products to deliver on defense orders ahead of any other orders. The rating could also be used by the producer to make sure he gets the materials he needs to carry out the contract. The rating is available for future orders and for contracts already outstanding. For the time being, there will be no complicated scale of priorities giving some defense contracts preference over others.

Partial Umbrella—Not covered by Regulation 2 are priorities for nonmilitary orders like freight cars or oil pipelines, military purchases such as office equipment which are nonmilitary in character and electric power, farm machinery, food and fuel which fall in the jurisdiction of other agencies. Look for the Agriculture and Interior departments to come up with similar regulations covering their products. The priority rating will be called a "DO" (Defense Order) rating. It will be issued by Defense or AEC to manufacturers or producers who supply those agencies directly.

Through Routing for Defense Orders

A producer must accept all rated defense orders offered him except: When acceptance would interfere with other rated contracts already accepted; when the customer—Defense, AEC or another manufacturer with a rated contract—isn't willing to meet "regularly established prices and terms"; and when acceptance would "cause a substantial loss of total production or a substantial delay in operations." Anyone violating Regulation 2 may be charged by the government with a crime and upon conviction may be punished by fine or imprisonment or both.

Steel Plans Shaping Up

NPA's Steel Products Advisory Committee of steel company officials holds first meeting

THE ORGANIZATIONAL meeting Oct. 4 of NPA's Steel Products Advisory Committee revealed:

1. The job of providing priority steel will require a large steel division conducted by a corps of men to be drafted from industry.

2. Most mills expect to ship more steel than they had promised in the fourth quarter.

3. There is no likelihood of early regulations limiting production of automobiles and other products.

4. A regulation assuring steel warehouses of ample shipments is being considered to protect the small consumers.

5. Action will be taken soon to relieve the shortage in alloys and stainless; probably end uses will be limited.

6. Voluntary allocations are favored to supply the freight car building industry with the 250,000 to 275,000 tons it needs a month.

7. NPA will act only on requirements covered by priority as determined by military and AEC procurement people; it's up to the individual steel user to get his regular tonnage for civilian purposes.

8. Government procurement officers will act on defense orders so as to allow at least 45 days' lead time on priority steel orders.

Members of the committee include: P. L. Francis, Alan Wood Steel Co.; Russell M. Allen, Allegheny Ludlum Steel Corp.; John A. Ingwersen, Armco Steel Corp.; H. B. Johnson, Atlantic Steel Co.; Paul Mackall, Bethlehem Steel Co.; Clyde Llewelyn, Bliss & Laughlin Inc.; F. S. Jones, Colorado Fuel & Iron Corp.; E. P. Severns, Continental Steel Corp.; R. E. Christie, Crucible Steel Co. of America; Joseph L. Block, Inland Steel Co.; Adam Hazlett, Jones & Laughlin Steel Corp.; Chad F. Calhoun, Kaiser Steel Corp.; J. F. Wiese, Lukens Steel Co.; J. A. Henry, National Steel Corp.; W. Martin Dillon, Northwestern Steel & Wire Co.; Joseph A. Voelker, Pittsburgh Steel Co.; J. M. Schlendorf, Republic Steel Corp.; D. B. Carson, Sharon Steel Corp.; David

F. Austin, U. S. Steel Corp.; N. C. Reed, Wheeling Steel Corp.; W. E. Watson, Youngstown Sheet & Tube Co.; and J. W. Anderson, Sheffield Steel Corp.

U. S. Backs Contract Loans

The government will guarantee loans to help you in the financing of military contracts.

The Federal Reserve Banks will administer a guaranteed loan program patterned after the V-loan plan of World War II. Guaranteeing agencies named in Executive Order No. 10161 are the Army, Navy, Air Force, General Services Administration and Commerce, Interior and Agriculture Departments. Under the Defense Production Act each of the guaranteeing agencies is authorized to guarantee loans made by banks and other lending institutions to individuals and private corporations to finance contracts and other operations which the agency considers necessary for the national defense.

Apprentice Training Lags

Defense production may be seriously hampered unless more apprentices register in critical occupations, says Director W. F. Patterson of the Department of Labor's Bureau of Apprenticeship.

Mr. Patterson states that of the 17,192 registered apprentices in those occupations listed as critical to the war production effort, 70 per cent are concentrated in only ten states.

Ravenna Arsenal To Hire More

The Ravenna, O., Arsenal will employ about 250 additional workers to speed up shell loading work. The plant needs explosives laborers and ammunition handlers, machinists, draftsmen, fork lift operators, car bracers and welders.

Allis-Chalmers Gets War Order

Allis-Chalmers Mfg. Co. will build high-speed, track-type cargo carriers for the Defense Department.

The company plans to build a new plant at its LaPorte, Ind., works to handle the contract. To construct the plant, Allis-Chalmers is tearing down three wooden warehouses with a total floor area of about 90,000 square feet.

During World War II, Allis-Chalmers made the 38-ton, M-6 prime mover for the Army. This vehicle was used to move the heaviest guns, haul the personnel to man the gun and carry initial supplies of ammunition. The LaPorte plant employs about 2500.

Munitions Board Snips Red Tape

If you avoid military contracts because of security clearance red tape, take heart. The Munitions Board has drawn up uniform policies for handling security clearances.

The major feature of the policies is that they will eliminate duplicate security investigations of the same contractor or his personnel by the three military departments. Security clearances of facilities and personnel are considered by the military departments only in connection with bids and contract work involving classified military information. Inquiries concerning security clearances should be made directly to the military procuring activity involved.

A Central Security Index File and a Security Requirements Check List also have been established. A file of all persons who have been investigated for access to secret information and the names of facilities investigated go to the index file. The check list pinpoints the specific parts of a contract that are classified.

Under Your Arm

PUT YOUR plant under your arm to show what your facilities can do when you're seeking orders from military procurement officials.

That's the advice of Norbert C. Rubin, vice president of Yoder Co., Cleveland. Writing in the newsletter of the Associated Industries of Cleveland, he says a movie of the Yoder plant has been "very helpful to us. It shortens the time needed to complete negotiations." He states that the Yoder movie was made at a modest cost and with little inconvenience to the company.

Hook Gets AMA'S Gantt Award

The American Management Association awarded the 1950 Gantt Memorial Medal to Charles R. Hook Sr., chairman of the board, Armco Steel Corp., Middletown, O. The medal was presented to Mr. Hook for "distinguished achievement in industrial management as a service to the community."

The medal has been awarded annually since 1929 by AMA and the American Society of Mechanical Engineers to commemorate the work of Henry L. Gantt, pioneer management engineer. Mr. Hook received the award at the AMA Personnel Conference in New York last week.

Foot in the Door

Four large steel firms meet with union to "receive and consider" wage demands

FOUR steel producers will meet with their unions today, Oct. 9, to "receive and consider" the CIO United Steelworkers' wage proposals. They are Republic Steel Corp., Jones & Laughlin Steel Corp., Youngstown Sheet & Tube Co. and Inland Steel Co.

The CIO wants across-the-board pay increases of at least 15 cents an hour. It wants no cost-of-living clause.

The initial demands may be up around 25 cents an hour or higher, but that's just a talking figure.

The Reasons Why — All companies agree to hear what the CIO has to say, but they emphasize that the meetings will be concerned with "the CIO's reasons why our contracts should be opened prematurely." Contracts across the industry are reopenable on wages Nov. 1, and the union is free to strike for higher pay Jan. 1.

In addition to a straight pay hike, the union will talk about special pay raises for skilled workers, elimination of differentials between workers on different turns or in different parts of the country and better vacation benefits.

Westinghouse Signs with IUE

Westinghouse Electric Corp. and the IUE-CIO have reached agreement on a new one-year contract, reopenable in six months on wages.

The agreement provides for a 10-cent per hour wage increase for all employees represented by the IUE, plus a one-cent an hour fund to correct wage inequities. Salaried employees covered by the contract would receive a salary increase of about $17.35 a month. The agreement also includes an improved pension and social insurance program. The pension plan is noncontributory on the first $4800 annual earnings and provides a minimum monthly pension of $100 (including Social Security) after 25 years' service.

Stewart-Warner Gives 9 Cents

Stewart-Warner Corp. has granted an immediate nine-cent-an-hour wage increase to 4500 production and maintenance workers at its main plant in Chicago. Two four-cent increases to take effect 12 and 24 months from now were also granted.

In addition, provision has been made for cost-of-living adjustments to be determined by Bureau of Labor

Statistics reports during a three-year period. The agreement is with AFL electrical workers. Although the company's contract with the union does not provide for an opening on wages until June, 1951, the increases were given on the possibility of a wage freeze before that date.

NEA

"WISE CHOICE": George J. Bott, successor to Robert N. Denham as general counsel to the National Labor Relations Board, was hailed as a wise choice by NLRB members who often clashed with Mr. Denham

Unemployment Declines

The nation's jobless total dropped to its lowest level in 21 months during September, Secretary of Commerce Charles Sawyer reports.

Unemployment slipped to 2,341,000 in the week ended Sept. 9 from 2.5 million in the week terminated on Aug. 12.

Some of the reduction was caused by the normal withdrawal of summer job seekers, mostly students, from the labor market. But most of the drop occurred among workers who were looking for nonagricultural jobs during August and found them by September.

The unemployment total in September was only about half as large as at the beginning of this year but there were still a few more people out of work than during the low unemployment period late in 1948. Total civilian employment fell to 61,226,000 in the week ended Sept. 9, compared with 62,367,000 persons at work in the August survey week. Despite the decline, total employment exceeded employment in September, 1949, by around 2 million and in September, 1948, by about 1 million.

Where Is the Steel Industry Expanding?

Sharon, Kaiser, U. S. Steel subsidiaries are among the producers who by the end of 1952 will boost the steelmaking potential by 9.4 million tons

BEEN WONDERING where the much-heralded expansions in the nation's steel industry are to be made?

For the last three months the steel industry and the government have been announcing how much more capacity is to be installed, and from time to time revising the figures upward.

Some of the expansion projects have already been announced but the curtain still unfolds from the projects that will make a reality of the projected increases in capacities. When all of the increases now planned for completion by the end of 1952 are done they will have boosted the country's steelmaking potential 9.4 million tons and made the overall annual capacity 109,963,000 net tons, says Commerce Secretary Charles Sawyer.

At the same time the blast furnace capacity in the United States will be raised at least 1,734,000 net tons to a yearly capacity of 73,378,000 tons of pig iron, he reports.

Sharon Is One

SHARON Steel Corp. is one of the companies that will expand. It is launching a $49-million, five-year program.

To help implement the expansion, the company just made two important moves: 1. It contracted with United States Steel Corp.'s Oliver Mining Co. to assure Sharon adequate iron ore for the next 15 years; and 2. leased 1600 acres of coal lands adjacent to Sharon's Joanne Coal Co. properties in Marion county, West Virginia, giving the company 3341 acres of coal lands.

On the Agenda — The "five-year plan," it is revealed by Henry A. Roemer Jr., Sharon president, contemplates construction at its Farrell, Pa., Works of a third 800-ton blast furnace; dropping of six open hearths and expanding the remaining eight from 100 to 250 tons capacity; addition of two 10-ton bessemer converters for duplexing and adding 300,000 tons of annual steelmaking capacity; installation of a 40 or 44-inch blooming mill and a 36 or 42-inch continuous hot strip mill.

Also projected are doubling of present stainless steel capacity and addition of 30 to 60 coke ovens at Fairmont, W. Va.

At conclusion of the program, Sharon will be able to produce 840,000 tons of pig iron and 1.5 to 2 million tons of steel ingots annually.

A Doer—Sharon's list of postwar accomplishments is literally astounding. Here are a few of the more important ones:

Purchase of its Farrell Works from Carnegie-Illinois Steel Corp., in 1945 for around $4.5 million. Replacement cost today would be $200 million to $300 million.

Purchase of Bopp Steel Corp., Detroit cold-rolled strip producer, and the Detroit Seamless Tubes Co., now merged into Detroit Tube & Steel Co.

Purchase of the Brainard Steel Co., Warren, O., producer of cold-rolled steel, coated products, strapping and welded steel tubing.

Purchase of Steel Trucking Inc., Dearborn, Mich., which hauls finished steel to Michigan plants and brings back scrap. Most other lines send their trucks back to Ohio and Pennsylvania steel plants empty.

Lease and purchase of extensive coal and coke properties in West Virginia and Pennsylvania.

Completion in 1949 of a new 10-stand, 14-inch hot strip mill at Farrell which rolls all types of steel, including stainless, in widths from 2½ to 8 inches; and modernization of an existing 24-inch strip mill.

Happy Birthday—Sharon this year is celebrating its 50th birthday. The company was organized Oct. 8, 1900 as the Sharon Steel Hoop Co. with 4000 shares of $50 par stock and it immediately purchased land along the Shenango river south of Sharon, Pa., and started construction of 8-inch and 9-inch hot mills to roll cooperage hoop, cotton ties and narrow steel bands.

The plant was built next door to the Sharon Steel Co.—later to become the Farrell Works of the Carnegie Steel Co.—so as to be near a source of billets. When Carnegie bought Farrell, a new contract for billets could not be negotiated and Sharon Steel Hoop was obliged to build an open-hearth shop, a blooming mill and a bar mill for producing billets. These facilities were abandoned in 1920, following acquisition of the Youngstown Iron & Steel Co. with a steel plant at Lowellville, O., 26 miles away.

Ground-floor Start — Henry A. Roemer Sr., now board chairman, came to Sharon as president in December, 1930. He started his career at 15 as a blast furnace laborer at

Struthers Iron & Steel Co., later becoming associated with American Sheet & Tin Plate Co., Youngstown Sheet & Tube Co., Superior Sheet Steel Co., Continental Steel Corp. and others.

The early thirties were difficult for Henry Roemer Sr. and the company but as the decade progressed, Sharon managed to expand its sales volume and to buy equipment for production of terne and zinc coated strip and to make other needed improvements. New electric furnaces were installed at Lowellville to make stainless steel and, in 1935, purchase of the Niles Rolling Mill Co. provided an outlet for about 200,000 tons of semifinished steel output annually. Subsidiaries now take about 22 per cent of Sharon's total output.

On June 2, 1950, Henry Roemer Jr. moved up to the presidency from vice president and general manager, with Henry Roemer Sr. remaining as chief executive and chairman of the board.

TC & I Is Another

ANOTHER of the new projects to be announced is that of United States Steel Corp. which will kick up the annual ingot capacity of one of its subsidiaries, Tennessee Coal, Iron & Railroad Co., 500,000 tons. This will raise the T. C. & I. yearly capacity from 2,850,000 tons to 3,350,000 tons.

To help obtain this additional 500,000 tons of steel capacity, the output of T. C. & I.'s existing blast furnaces in the Birmingham district will be stepped up through the blending of imported iron ore with the lower grade Alabama ores. Then to convert such increased production of iron into steel, new open-hearth furnaces and certain auxiliary facilities will be installed at the Fairfield, Ala., works, Robert Gregg, president of T. C. & I., explains.

To handle imports of foreign iron ore for this expanded capacity, T. C. & I. will install ore transfer facilities at the port terminals which it acquired recently at Mobile, Ala.

Second Step—Additional steelmaking capacity will be available within 18 to 24 months after the expansion work starts.

The T. C. & I. expansion is the second step in U. S. Steel's program to boost its steelmaking capacity to help meet the country's preparedness needs.

In July, 1949, U. S. Steel Corp. announced the first step: Improvement and additions to facilities in the Pittsburgh and Chicago districts to increase annual steelmaking capacity 1,660,000 tons by the end of 1951. This work is now underway.

Kaiser Adding More

STILL ONE MORE steel expansion project is that under which Kaiser Steel Corp. will enlarge its Fontana, Calif., plant's annual steelmaking capacity 15 per cent, or 180,000 tons, and build a tin plate mill. This expansion cost is estimated at $24.5 million.

To raise the ingot capacity, the company will build a 200-ton open-hearth furnace; this will give Kaiser eight open hearths, and raise its annual steelmaking capacity to 1,380,000 tons. Additional soaking pits and blooming facilities will be constructed.

Second Tin Plate Mill in Far West—The new tin plate mill will have a yearly capacity of 200,000 tons of hot-dipped and electrolytic tin plate. It, says Henry J. Kaiser, company president, will be the second tin plate mill west of the Mississippi river, the other being located in northern California.

Funds for the $24.5 million expansion program would come from a $125 million financing program. In addition to providing for the expansion, the financing program would repay in full the company's indebtedness to the Reconstruction Finance Corp. and furnish additional working capital. Payment of the balance of $91,082,990 it owes on its war-time loan from the RFC would place the company on a basis of being financed entirely by private funds.

The $125 million financing program consists of: $60 million in first mortgage bonds to be sold directly to institutional investors; $25 million bank credit agreement with three large banks; and $40 million through 1,600,000 shares of preferred stock and 800,000 shares of common stock to be underwritten by a nationwide banking group. The stock sale would be the first public offering of securities of Kaiser Steel Corp.

Grand Total—Registration statement filed with the Securities & Exchange Commission shows the capital invested in property, plant and equipment is $142,193,000 and in other assets, $20,662,000, making a total of $162,855,000.

The Kaiser plant at Fontana is the outgrowth of a need for steel on the West Coast during World War II. With the aid of an RFC loan the ground for the plant was broken in April, 1942.

Furnace Contract Reported

Contract for construction of a 1500-ton daily capacity blast furnace for Great Lakes Steel Corp., Detroit, has been awarded to Freyn Engineering Co., Chicago, STEEL was told last week.

The stack, to be located at the Great Lakes works at River Rouge, would be the fourth at the plant.

Why Not Enough?

Kaiser got Coverdale & Colpitts to compile figures on steel supply and demand

WHY there isn't enough steel to go around is brought out sharply by the accompanying table compiled for Kaiser Steel Corp., Oakland, Calif., by the engineering firm of Coverdale & Colpitts, New York.

While the figures are specifically for the seven farthest west states, they also reflect conditions, to some degree at least, in the rest of the U.S.

The Coverdale & Colpitts estimates of the normal annual demand for the next five years are far greater than the average annual consumption during the 1936-1940 period.

Wide Gap—Increased demand perpetuates the wide gap between western requirements and western production, despite the substantial increases in West Coast steel producing capacity.

In 1949, rolled steel production in the West was approximately 2.4 million tons, four times the output in 1941, but the demand in 1949 required

Mushrooming Market

Steel Demand in 7 Western States

On some products the area's productive capacity is sufficient to fill the bulk of normal requirements, but on others it isn't

INSUFFICIENT Capacity	1936-1940 Average Consumption	1951-1955 Average Demand
Sheets	250,000	558,000
Tin Plate	399,000	634,000*
Strip, cold-rolled	13,000	74,000
Pipe, continuous weld sizes	137,000	308,000
SUFFICIENT Capacity	**1936-1940 Average Consumption**	**1951-1955 Average Demand**
Plates	160,000	255,000
Structural Shapes	185,000	419,000
Bars	305,000	667,000
Strip, hot-rolled	22,000	85,000
Pipe, larger sizes	221,000	601,000**

* Subsequently revised upward. Actual 1949 consumption was 700,000 tons

** Includes pipe fabricated in western shops to be shipped outside the seven western states

importation from other sections of the country of approximately 2 million tons of rolled products.

Western requirements of sheets, tin plate, cold-rolled strip and continuous weld pipe are so large that they far outstrip the West's ability to satisfy the bulk of normal demand. The West, for instance, supplies only one-third of its own tin plate requirements of 700,000 tons a year.

The demand-supply ratio in plates, structural shapes, bars, hot-rolled strip and large-size pipe is in more even alignment.

The big jumps in the estimates of demand for 1951-1955 over consumption during 1936-1940 result to a great degree from a phenomenal rise in the number of western metalworking establishments. In less than ten years they have doubled.

Tower of Babel Gets Organized

Is it a barrel, cask, keg, breaker or hogshead? The Munitions Board and General Services Administration are making progress in whittling down the Tower of Babel, one of the factors that complicates federal procurement.

The cataloging of military supply items is now 37.2 per cent completed and should be finished by June 30, 1952. Development of a federal catalog system is being co-ordinated by the Munitions Board's cataloging agency under an agreement between the Department of Defense and GSA. By June 30, 1950, 931,616 items had been described under a uniform system designed to increase supply effectiveness, facilitate single-service procurement, reduce procurement cost, save storage space, reduce personnel requirements, reduce investment in inventory, facilitate standardization and reduce the number of procurement items. The whole cataloging job should be finished by June 30, 1952.

Already the catalog is proving an aid in detecting and eliminating duplicate items of supply, in the determination of interchangeability of items and in standardization.

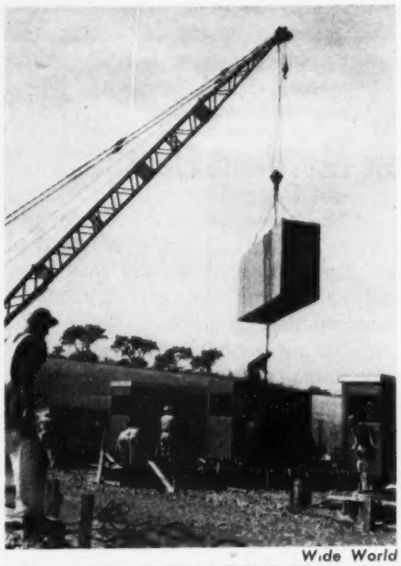
As soon as the cataloging tools—approved names and description patterns—are made available, industry will be requested to furnish technical descriptions of materials and parts supplied to the government.

What's Role of Small Industries?

What's the role of the small, specialized industry in defense efforts? That question was asked at the semi-annual meeting of the Rail Steel Bar Association in Chicago.

Association members agreed that their small mills probably can be more completely utilized for war work by production of diversified light-weight special sections. The little industry already has made a big step toward diversification. Shipments of high-strength steel sections other than reinforcing bars and carbon bars has increased 47 per cent over shipments of similar sections last year.

The high-strength characteristics of the industry's steel products may find new uses in a fractional war economy for such things as bomb shelters. That was pointed out by H. J. Gilkey, professor at Iowa State College and the featured speaker at the meeting.



Wide World

FOR WHOM THE BOOTHS TOLL: Motorists who journey along the eastern extension of the Pennsylvania turnpike will pay their tolls at these prefabricated steel booths being placed at each of the seven interchanges on the extension. Top sections will be canopied by steel girders and stainless steel for the all-weather protection of toll house personnel who collect the cent-a-mile fares

UE in the Red

THE COMMUNIST-dominated United Electricalworkers is in the red, financially as well as politically.

That is the charge of CIO's IUE, formed to supplant the older union.

James B. Carey, chairman of the IUE, says the independent group has had to fire nearly half of its organizational staff and cut the pay of the remaining employees 10 per cent. He claims that the UE now has less than 172,000 members, a loss of at least 300,000 from a year ago. In July it spent $51,600 more than its income, he points out.

Seeks More Warehouse Steel

Best way to make National Production Authority's Inventory Control Regulation No. 1 work, as far as steel is concerned, is to have prompt replenishment and maintenance of steel warehouse stocks, says Walter S. Doxsey, president, American Steel Warehouse Association.

Shortage of essential steel supplies is alarming, he asserts in a letter to Secretary of Commerce Charles Sawyer. Stocks of industrial steels in the nation's warehouses have shrunk 40 per cent in the last 12 months, Mr. Doxsey reports.

"Extraordinary demands during the last several months, coupled with curtailed shipments from producers, are accelerating this depletion, handicapping our armament program and seriously threatening the activities of the hundreds of thousands of small manufacturing enterprises that are dependent upon distributors' stocks of steel because their requirements are too small to place with producers," Mr. Doxsey declares.

A survey by the association shows warehouse inventories dropped 439,920 tons since September, 1949. This loss lowered inventories to 782,866 tons.

If adequate supplies of steel can be kept in the warehouses, the armed forces as well as other users will not find it necessary to build up abnormally large inventories to assure availability of small lots and incidental items.

Westinghouse Plans TV Switch

A proposal to equip future Westinghouse television receivers with a switch and a receptacle so a plug-in circuit could be used to convert color signals for black and white reception was suggested in a statement filed with the Federal Communications Commission by Westinghouse Electric Corp.

The suggested system would entail a two-position switch. On position one, the set would receive black and white signals. Once FCC decides on color standards, Westinghouse proposes to design and manufacture a plug-in unit that would convert color signals to black and white with the switch on position two.

Westinghouse says "time has not

permitted the completion of our research on the problem, but results so far show that adoption of the program will make the new standards available to the public at a minimum cost." Design work on adding the switch and receptacle to the chassis is in process.

Ship May Be Prototype for New Merchant Fleet

THE MARITIME Administration is asking for bids on the preparation of specifications and working plans of a fast new cargo vessel that may be the prototype of a defense fleet.

Reports are untrue that it plans immediate construction of 50 of the new ships, the administration told STEEL. The question of how many such vessels will be built has not yet been determined. Nor, it says, is there any basis for rumors that a 28-knot ship is in prospect. Such speed is not yet practicable in a merchant vessel. The ship being considered is a 20-knot, 12,500-ton dry cargo vessel, which can outrun any submarines known today.

A Matter of Research—The administration's action is part of its regular research procedure. It works up the basic plans for a proposed vessel, then asks marine engineers to bid on preparation of detailed contract and working plans and specifications.

If all the specification, cost and planning bugs are worked out satisfactorily by the successful bidder, then the administration may order the ship built—often only one. Such an evolution preceded a construction award let last year for an 18½-knot ship to be launched soon from the Ingalls Pascagoula yard.

To Carry the Goods—The new defense vessel would carry two and one-half times as much cargo per year as the old Liberty of World War II. She will be about 525 feet long, and her plans will call for interchangeability of parts.

Following withdrawal of 136 Victory ships (14 to 16-knot vessels), the administration still has 75 Victories in its moth-ball fleet. The reserve fleet also contains about 1500 Liberties (8 to 10-knot) which could be operated in convoy until the need for and the kind of new ships became more clear-cut.

Two More Ore Boats Ordered

Columbia Transportation Co., the vessel associate of Oglebay, Norton & Co., Cleveland, has placed orders for construction of two new bulk ore freighters for the Great Lakes.

The vessels, costing over $5 million each, will have a 19,500 cargo deadweight tonnage at 25-foot draft. Acquisition of the two large new ships will increase Columbia's bulk fleet to ten vessels. Bulk vessel trip capacity will be increased by 50 per cent, from 78,000 tons to about 117,000 tons. In addition to its bulk vessels, Columbia has five crane vessels and five self-unloaders.

The carriers will be 647 feet in length overall and have a 70-foot beam. Geared steam turbines will enable the vessels to move at 16.3 miles per hour when loaded. Each ship will have 19 hatches, spaced on 24-foot centers.

One vessel will be built by Great Lakes Engineering Works at River Rouge, Mich. Delivery has been set for June, 1952. The other will be built at Lorain, O., by American Ship Building Co. and delivered in August, 1952.

A giant leap in boat building activity has occurred on the Great Lakes. Only one major vessel, Inland Steel Co.'s ore-carrying *Wilfred Sykes,* has been built since the end of World War II. Now, eight are on order—seven ore carriers and one limestone vessel. An eighth ore carrier will be announced soon, to be built by American Ship Building.

Besides the two ore boats ordered by Columbia, other vessels on order are: Three ore ships for Pittsburgh Steamship Co., a subsidiary of U. S. Steel Corp.; one limestone-carrying vessel for Bradley Transportation Co., another U. S. Steel subsidiary; one ore vessel for Interlake Steamship Co.; and one ore vessel for Cleveland-Cliffs Steamship Co.

Dravo Grants 15-cent Package

Dravo Corp. and the CIO Industrial Marine & Shipbuilding Union signed a package agreement approximating 15 cents an hour. It covers 800 employees of the company's Engineering Works Division.

The agreement provides for a 5 per cent wage increase across the board, plus an additional two cents an hour in two job classifications. It also incorporates retirement benefits, expansion of health and welfare provisions and certain other wage adjustments. The agreement runs to Nov. 7 next year, without either party having the right to reopen.

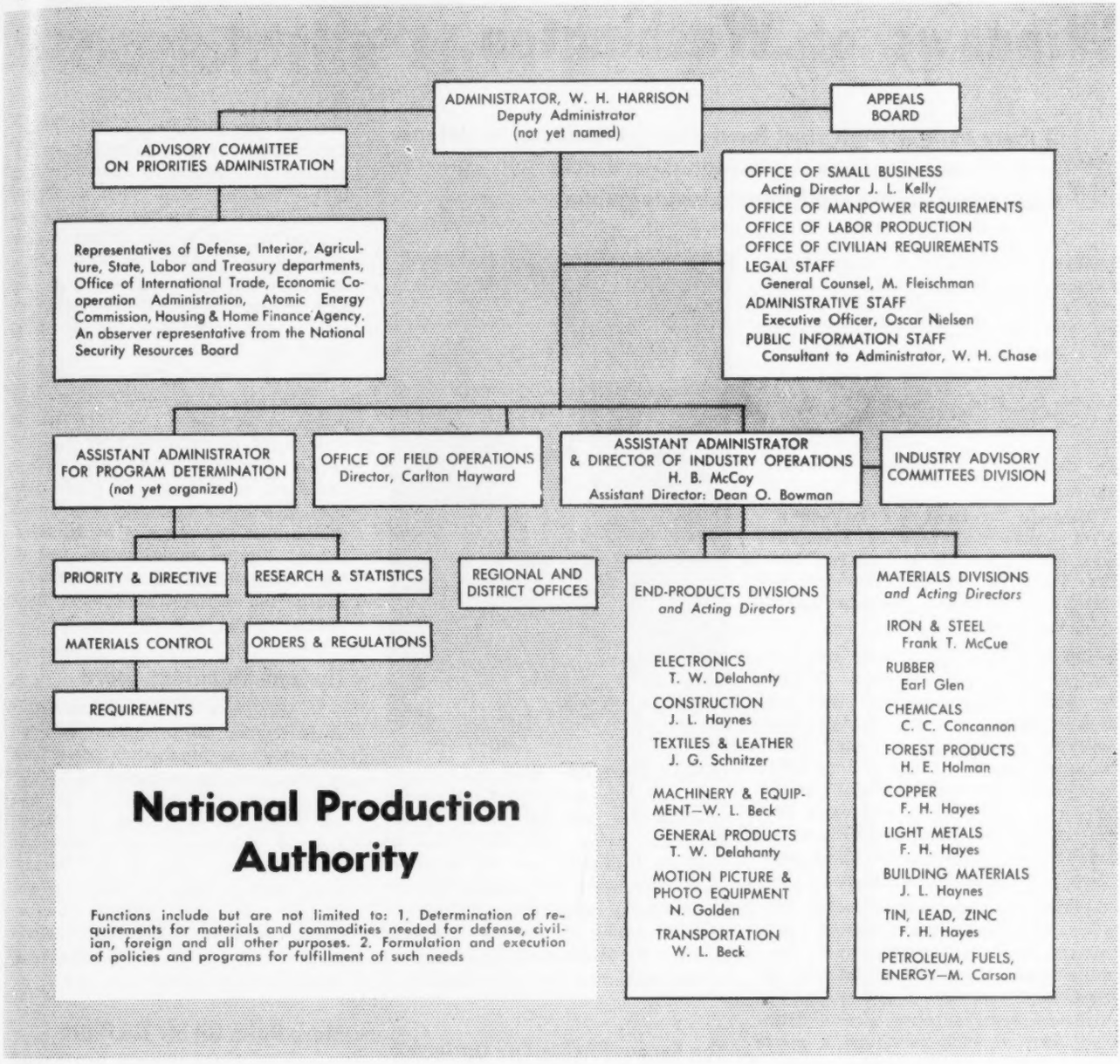
After three years' service, CIO workers, under the terms, can participate now in the Dravo retirement plan which went into effect last July 1. The plan is contributory.

Cleveland Furnace Breaks Out

Breakout in the hearth of No. 5 blast furnace at Republic Steel Corp.'s plant in Cleveland temporarily reduced iron production there last week.

The stack is the largest of five at the Cleveland plant and is operated on high top pressure. It is owned by the government, which built it during World War II. Two years ago it was the center of much controversy when Kaiser-Frazer Corp. and Republic each sought a lease on it. K-F obtained a lease, and Republic operates the furnace under an agreement with K-F.

FEDERAL MARITIME BOARD: New addition to the Federal Maritime Board family is Robert W. Williams of Baltimore. Left to right are Albert W. Gatov; Vice Adm. Edward L. Cochrane, U.S.N. Ret., who is chairman of the board; and Mr. Williams, who is a specialist in admiralty law


ADMINISTRATOR, W. H. HARRISON
Deputy Administrator
(not yet named)
APPEALS BOARD
ADVISORY COMMITTEE ON PRIORITIES ADMINISTRATION
Representatives of Defense, Interior, Agriculture, State, Labor and Treasury departments, Office of International Trade, Economic Cooperation Administration, Atomic Energy Commission, Housing & Home Finance Agency. An observer representative from the National Security Resources Board
OFFICE OF SMALL BUSINESS
Acting Director J. L. Kelly
OFFICE OF MANPOWER REQUIREMENTS
OFFICE OF LABOR PRODUCTION
OFFICE OF CIVILIAN REQUIREMENTS
LEGAL STAFF
General Counsel, M. Fleischman
ADMINISTRATIVE STAFF
Executive Officer, Oscar Nielsen
PUBLIC INFORMATION STAFF
Consultant to Administrator, W. H. Chase
ASSISTANT ADMINISTRATOR FOR PROGRAM DETERMINATION
(not yet organized)
OFFICE OF FIELD OPERATIONS
Director, Carlton Hayward
ASSISTANT ADMINISTRATOR & DIRECTOR OF INDUSTRY OPERATIONS
H. B. McCoy
Assistant Director: Dean O. Bowman
INDUSTRY ADVISORY COMMITTEES DIVISION
PRIORITY & DIRECTIVE
RESEARCH & STATISTICS
REGIONAL AND DISTRICT OFFICES
MATERIALS CONTROL
ORDERS & REGULATIONS
REQUIREMENTS
END-PRODUCTS DIVISIONS
and Acting Directors
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T. W. Delahanty
CONSTRUCTION
J. L. Haynes
TEXTILES & LEATHER
J. G. Schnitzer
MACHINERY & EQUIPMENT—W. L. Beck
GENERAL PRODUCTS
T. W. Delahanty
MOTION PICTURE & PHOTO EQUIPMENT
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F. H. Hayes
LIGHT METALS
F. H. Hayes
BUILDING MATERIALS
J. L. Haynes
TIN, LEAD, ZINC
F. H. Hayes
PETROLEUM, FUELS, ENERGY—M. Carson
National Production Authority
Functions include but are not limited to: 1. Determination of requirements for materials and commodities needed for defense, civilian, foreign and all other purposes. 2. Formulation and execution of policies and programs for fulfillment of such needs

How About Dollar-a-Year Men?

A number of men who served in WPB and OPA in World War II have asked STEEL whether, if they again are called into government service, it will mean giving up their present jobs. Answer: NPA plans to staff itself with full-time government employees. For top jobs a few men will be taken from industry. The Commerce Department, of which NPA is a unit, has full authority under the Defense Production Act to enroll industry men "without compensation;" it has not yet formulated a definite policy, but precedent seems to have been established by the appointment of General Harrison as NPA administrator "without compensation." It permits him to remain on the payroll of the International Telephone & Telegraph Co. The only comment that now can be made about the Price and Wage Stabilization organization, not yet established by the President, is that it has the same discretion under the act.

Anyone Available for NPA?

Trade associations such as the Malleable Founders Society are receiving letters from the Commerce Department asking the groups to canvass their membership for executives who would be willing to work for the National Production Authority.

Interior Forms Defense Agency

The Interior Department has established a Minerals & Energy Administration to administer responsibilities delegated to the department under the Defense Production Act of 1950.

Secretary Oscar L. Chapman will be administrator of the new administration which will be made up of four industry agencies, each to be headed by an assistant administrator. Hugh A. Stewart, director of Interior's Oil & Gas Division, is temporary head of the petroleum and gas defense agency. D. L. Marlett, assistant administrator of the Bonneville Power Administration, has been named in the interim to handle defense matters in electric power. Defense activities in solid fuels will be handled for the present by Dan H. Wheeler who has been assistant director of Interior's Division of Territories. James Boyd, director of the Bureau of Mines, will head the Metals & Minerals Agency. George Lamb, assistant to the president of Pittsburgh Consolidation Coal Co., will be a consultant on solid fuels. Alfred C. Wolf, director of Interior's Program Staff, will co-ordinate work in setting up the new defense organization.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

If there isn't enough steel for civilian purposes after defense and priority tonnage is indicated, cutbacks will come in such payment-deferred items as automobiles

LEADING QUESTION still being asked in Washington by steel consumers is: Will I get enough steel? In National Production Authority files alone are several hundred letters complaining about the situation or asking for help. Though they come from a small percentage of the country's 300,000 steel consumers, they are thought to be indicative of widespread concern.

Through the Hedge — In general, NPA's answer—hedged by what future conditions can be foreseen now—is yes. The vast majority of consumers, according to present plans, should get enough steel.

Defense and other priority tonnage will, of course, get taken care of first. If there's not enough steel left for miscellaneous civilian needs after priority tonnage is indicated, there definitely will be a move to limit auto production and output of other products that are usually sold on a deferred payment plan. Thus would be freed large quantities of sheet and strip, the scarcest in supply.

Period—If still further moves are necessary, finally would come a steel warehouse order under which the mills would be instructed to ship to the warehouses the same tonnages as in some representative period (the first half of 1950 would be a good example) and in the same product mix. A move like that would stabilize the economy to some extent; it would enable small consumers, who represent a great majority of the 300,000 steel buyers, to get their supplies.

Another Look at Rearmament?

The entire question of forward steel supply will be influenced profoundly by the action Congress may take on the rearmament program. In Washington the disposition is to take seriously President Truman's fear that Congress—if there is no shooting war when that body reassembles in November—will act to slow down the program, say, by stretching out over five years a job originally slated for two years. If there is no shooting war, many of the congressmen who, under the spur of the Korean war, voted $30 billion odd for rearmament this fiscal year, will want to take another look at the situation.

NEA

DEPUTY STEPS UP: William Chapman Foster, deputy Economic Cooperation administrator, will take over as administrator when the resignation of Paul G. Hoffman from the post becomes effective. Mr. Foster's appointment will be submitted to the Senate when Congress reconvenes late next month. Mr. Hoffman resigned his post to head the Ford Foundation

The Excess Profits Tax Outlook

As an indication of how congressional sentiment has softened with the turn in Korea, STEEL is told by an influential congressional staff adviser that the outlook for an excess profits tax has changed. "Excess profits," he said, "are earned on war contracts; if there is no war there will be no substantial excess profits and no excess profits tax." Furthermore, he said, there is no likelihood that the higher taxes imposed on corporate income in 1950 will be further increased.

Fiscal Reconnoitering Likely

If there is no shooting war when Congress comes back after the elections, the fiscal picture is certain to be re-scrutinized. Here is the score as one congressional adviser figures it: Total appropriations for this year, including permanent indefinites, are $59 billion as against $45 billion last year, or an increase of $14 billion. Tax collections this year will be increased $4.5 billion by reason of the higher income taxes, and $2 billion from increased business activity, or a total of $6.5 billion. That means an additional deficit of $7.5 billion or, allowing for recurrence of the $3.1 billion deficit of fiscal 1950, a total deficit of $10.6 billion for fiscal 1951.

That is a disturbing prospect—provided there is no shooting war. Some congressmen will want to stretch out rearmament over a longer period. Not only would this improve the fiscal picture, but it would prevent large-scale manufacture of arms that are on the verge of being superseded. For example, latest talk in the Pentagon building says the shaped charge for antitank weapons is about to obsolete the tank.

Tip from Munitions Board

A Munitions Board spokesman is authority for the prediction that any full-scale war emergency immediately would bringe a freeze of all machine tools—new and used—in dealers' hands and in process of construction or rebuilding. This makes it good sense for users to buy immediately, and get installed in their production lines, such tools as they urgently need to lower unit costs in the face of the present rising trend in hourly wage rates.

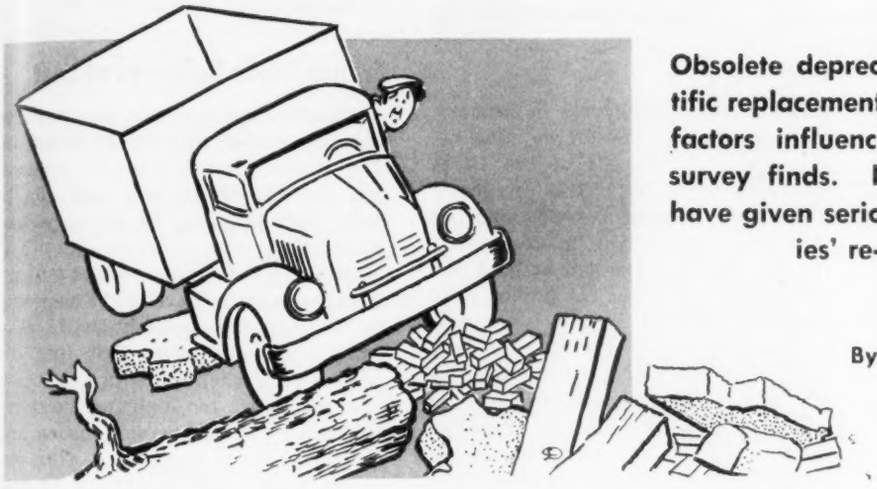
More Palm Oil for Tin Plate

A new source of palm oil soon will open to the tin plate industry—Central America. Excepting El Salvador, all the Central American republics have made a good start on planting African oil palms and Honduras and Costa Rica will have oil processing plants in operation by year end. Prime purpose is a better diet in those countries where fat consumption has been 9 pounds per capita annually compared with 66 pounds in the U. S. But there will be a substantial surplus for export.

Needed: A Really Good Tool

Needed, says Agriculture's Agricultural Research Administration, is a really good implement for digging sweet potatoes. The best present tool, the ordinary 16-inch turning plow, causes too much loss by skin damage. ARA condemns the so-called "rod-wing middlebuster" for excess skinning.

Roadblocks Hamper Re-equipment



Obsolete depreciation laws and lack of scientific replacement programs still outweigh other factors influencing good replacement, STEEL survey finds. Neither stockholders nor labor have given serious opposition to their companies' re-equipment programs

By JOHN S. MORGAN
Associate Editor

FACTORS causing inadequate equipment replacement in industry outweigh factors influencing good replacement, but the scales are slowly shifting. That conclusion is based on a survey of 50 metalworking companies made by STEEL to determine their re-equipment policies and related matters.

The survey shows that the two big roadblocks in the path of sound equipment replacement are the inadequate depreciation credits permitted by the government's obsolete tax policies and the lack of scientific replacement programs by metalworking companies.

Eighty per cent of the companies responding to the survey believe that tax depreciation allowances are inadequate to give them sufficient equipment replacement reserves. Many of the 20 per cent that thought reserves were adequate qualified their stand by saying "sufficient on some types of equipment only." About 80 per cent of the companies have no formal system of setting aside funds other than tax depreciation reserves to buy replacement or additional new equipment. Those companies are forced on a "buy as you go" plan. The smaller companies participating in the survey make up much of the 80 per cent who set aside no other funds for machinery. Larger firms can afford a formal funding program to supplement depreciation reserves.

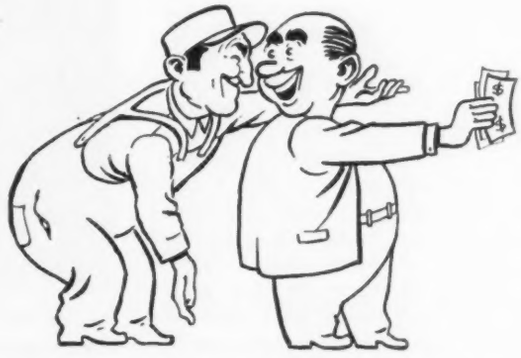
Fortunately, most of the companes (73.3 per cent) earmark capital recovered by depreciation for new equipment. They don't let funds accumulated as tax credits fritter away. Tax experts estimate that the proportion of companies who earmark recovered capital is 15 to 20 per cent higher now than five years ago, so more concerned is industry about depreciation and re-equipment matters. (For other articles in STEEL's series on depreciation and re-equipment, see issues of May 8, pp. 53-56; June 19, pp. 59-60; July 31, pp. 42-43; and Aug. 21, pp. 70-71).

The extent of the second major obstacle to good equipment replacement—lack of scientific basis for studying re-equipment needs—is serious; 92.8 per cent of the companies participating in the survey have no formal program of equipment analysis. Furthermore 83.3 per cent are planning no such program.

But a hint that the situation may improve lies in this: 60 per cent of the companies say they know what the latest production equipment can do. The 40 per cent who admit they're not up on the subject are mostly small firms that don't have the personnel to devote to the matter. Several little companies complain that representatives of equipment producers give them only a lick and a promise in their infrequent calls.

Another portent that shows the scales are shifting to improved equipment replacement is this: Stockholders are realizing more and more the dangers of technological stagnation. Stockholders in 86.7 per cent of the companies participating in the survey exert no undue pressure for dividends. When money is not available to buy new machinery, it is usually not because stockholders are demanding too much from the kitty.

Banks, too, are sympathetic to re-equipment plans: 70 per cent of the companies say the banks they deal with appreciate the importance of new and more efficient equipment in operating a company successfully.



The attitude of labor toward the matter is also excellent. Some 93.3 per cent of the companies say labor opposes no equipment purchases that would mean more production per man hour. In the rare cases where labor does object, the companies buy the machinery anyhow.

Foreign Currencies Stabilize

Devaluation helped, but so did the world business boom given impetus by the Korean war. Canada removes monetary controls

CURRENCY devaluation — Britain started it in September, 1949—has been in effect about a year. The major object was to narrow the U. S. dollar gap. How has devaluation contributed to that objective?

Benefits arising from the revaluations can be clearly traced for the first six months after September. In the second six months the prosperous times came as much because of the Korean-engendered world business boom as because of the currency manipulation.

Shot in the Arm—Europe's total exports increased 15 per cent in volume in the first six months after the September devaluation, compared with the six months preceding it. Europe's exports to the Western Hemisphere rose 40 per cent. The dollar value of those Western Hemisphere exports increased, in spite of devaluation, by 10 per cent to $1160 million.

Exports from Europe to overseas areas other than the Western Hemisphere remained constant, while exports from the U. S. showed a general decline. The European exporting countries that devalued most (Britain, West Germany) shared to the greatest extent in the improvement in exports.

Import Shift — Europe's imports from overseas showed a further shift away from hard currency sources. A particularly marked drop occurred in West German imports from the U. S. The U. K. and most continental European countries made important shifts in their imports away from Canada and toward soft-currency countries.

The volume of intra-European trade in the six months following devaluation was 27 per cent higher than during the preceding six months.

Intertwined—The record of the second six months — beginning April, 1950—was bolstered by the U. S. boom and the Korean war. Western European steel sales to America jumped 150 per cent between the first and second quarters of this year, ECA reports. U. S. purchases of steel from Europe have continued to increase since the end of June. Other major European goods finding larger markets in the U. S. include new automobiles, glass and clay products.

The excess of U. S. exports over imports in July, 1950, was $51 million. The excess in July, 1949, was $434 million. The excess in January, 1950, before the Korean war and before the full impetus of the U. S. business boom, was $113 million.

Currency Confidence—So rapid has been the improvement in the world's U. S. dollar position that at least one country, Canada, is taking steps to restore the cut made a year ago. Canada will allow its dollar to float free on world exchange markets for the first time in 11 years. The move is expected to upgrade the Canadian dollar which as of Sept. 30 was at a 9.1 per cent discount in relation to the U. S. dollar. All controls on imports of consumer goods from the U. S. will be eliminated Jan. 2. Imports of capital goods, which are under the jurisdiction of C. D. Howe, minister of trade and commerce, will be reviewed by the minister.

Although Canada is up-grading and the general trend is toward stronger currencies among the nations which devalued a year ago, the increasing world inflation could upset the apple cart. In Australia, the rapidly rising cost of living may force a revaluation of the pound.

French Trade Balances at Last

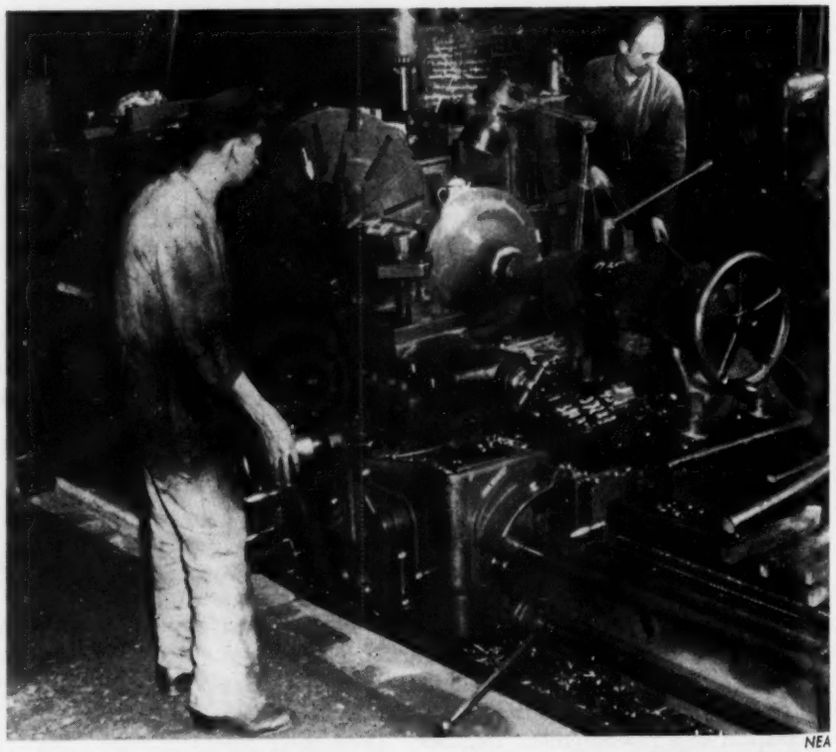
French exports paid for imports for the second time in 20 years in July, 1950. Percentage of imports paid by French exports was 108 in July, 93.5 in June, 92 in May and 85 in April.

Despite the rapid improvement, French exports haven't been going to the countries—notably the U. S.—from whom she buys. Principal obstacles to French sales in the U. S. are: Prices are too high; productivity is too low; U. S. customs duties and their methods of application often discourage any French attempt to sell.

France and all other European countries are taking an unusual interest in the tariff-cutting negotiations in which the U. S. is participating at Torquay, England.

Germans Worry About Prices

The Germans have their eye on the export markets in the present dis-



NEA

MIGHT NOT TAKE LONG: German production experts and British disarmament engineers charged with the dismantling of the Rhinemetal Borsig plant in Dusseldorf and the Krupp plant in Essen say the plants can be geared to produce arms once more if necessary. The Rhinemetal Borsig plant, formerly used for manufacturing shells and light cannon, has been partially converted to automoble and textile machinery production. The Krupp plant, which once manufactured heavy artillery and other steel products, now makes peacetime products like locomotives. Such machinery as this turning lathe in the Krupp plant could be adapted to production of arms

cussion about prices in connection with the Schuman Plan. The French want the lower Ruhr steel and coal prices raised to the French level under the unification program. The Germans are protesting, but their opposition will probably be overriden.

Ruhr steelmen complain that only a few real steel experts participate in the politically dominated negotiations.

Another pressure on the Ruhr coal price structure threatens because of new labor demands for higher wages. The industry is already operating in the red and would have to raise prices to meet wage demands.

The reorganization of the steel industry is still moving slowly. The 11 German custodians in charge of the steel industry are being criticized both by the German steelmen and the Allies. Steelmen claim most of the custodians know nothing about the job.

Allied authorities indirectly support that view when they charge that the custodians are moving too slowly in the reorganization task.

Four Bridges Win Beauty Contest

American Institute of Steel Construction has named these four steel bridges as the most beautiful opened to traffic in the U.S. in 1949:

Class I, for bridges with spans of 400 feet or more—North Main Street High Level Bridge, Akron.

Class II, for bridges with spans under 400 feet, costing over $500,000—Pinto Creek Bridge, 11 miles east of Superior, Ariz.

Class III, for bridges with spans under 400 feet, costing less than $500,000—Tenth Street Bridge, on the Expressway at Atlanta.

Class IV, for movable bridges—Passaic River Bridge, Rout S-3, crossing the Passaic river between Clifton and Rutherford, N. J.

Eutectic Opens School to U. S.

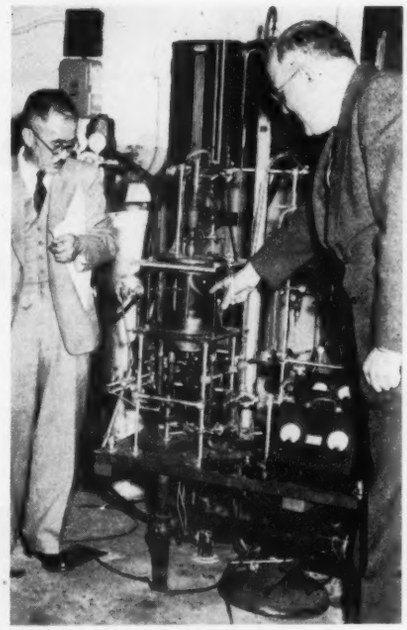
Eutectic Welding Alloys Corp. is extending enrollment without charge in its Welding Institute in Flushing, L. I., N. Y., to government employees and members of the armed services.

Now in its second year, the institute was established by Eutectic President R. D. Wasserman. Enrollment has been open on a tuition basis to students from manufacturing and engineering and research organizations.

Youngstown Holds Open House

Youngstown Sheet & Tube Co. will hold a Golden Anniversary Open House at its Indiana Harbor plant in East Chicago next week. The event will be the half century mark of the company that was organized by a small group of eastern Ohio business leaders in the fall of 1900. From its original capitalization of $600,000 the company has grown into a major steel producer with a capitalization of over $250 million and an employment of over 26,000.

The event will permit the first public visit to the new No. 2 continuous weld tube mill that went into operation several months ago.



TWAIN MEETS: Yasushi Watanabe of Tohuku University, Japan, listens as Dr. Harold K. Work, director of the research division of New York University's College of Engineering, explains the operation of a novel arc-melting unit for production of titanium alloys. Accompanied by professors of Kyoto and Hokkaido universities, the Japanese educator is making a tour of the U.S. under the Exchange-of-Persons Program sponsored by the Army's Far East Command

Maintenance Studied at Meeting

An 18-point program of plant maintenance techniques has been set for discussion at the Plant Maintenance Conference to be held in conjunction with the Plant Maintenance Show scheduled for next Jan. 15-18 at Cleveland's Public Auditorium.

General conferences will start with a discussion of preventive maintenance. Also on the agenda are maintenance of electrical equipment, maintenance of power plant and heating equipment, maintenance problems of the small plant and selection and maintenance of lighting equipment.

New Tips on Boilers and Tanks

Printed copies of Simplified Practice Recommendation R8-50, Ferrous Range Boilers, Expansion Tanks and Solar Tanks, are now available from the Commodity Standards Division of the Office of Industry & Commerce, U. S. Commerce Department.

The recommendation, originally issued in 1923, consists of a simplified schedule of sizes, capacities and working pressures for range boilers, expansion tanks and solar tanks make of ferrous metals. It includes data on size, location and number of tappings and drawings showing the location of tappings and applicable dimensions. The edition lists two additional sizes of expansion tanks and the gages of metal for shells for range boilers and expansion tanks.

Printed copies may be secured from the Superintendent of Documents, Washington 25, for 5 cents. A discount of 25 per cent will be allowed on orders for 100 or more copies.

Strand Unveils New Garage Door

Detroit Steel Products Co.'s Strand Garage Door Division announces a new 9-foot wide, all-steel garage door that will be distributed through lumber dealers. Bob Kirkman, manager of the division, says the new door, like all Strand doors, is made of galvannealed steel to protect against rust even when the doors are exposed to weather for weeks without painting. A new X-type steel bracing is used to add strength and rigidity to the one piece door leaf.

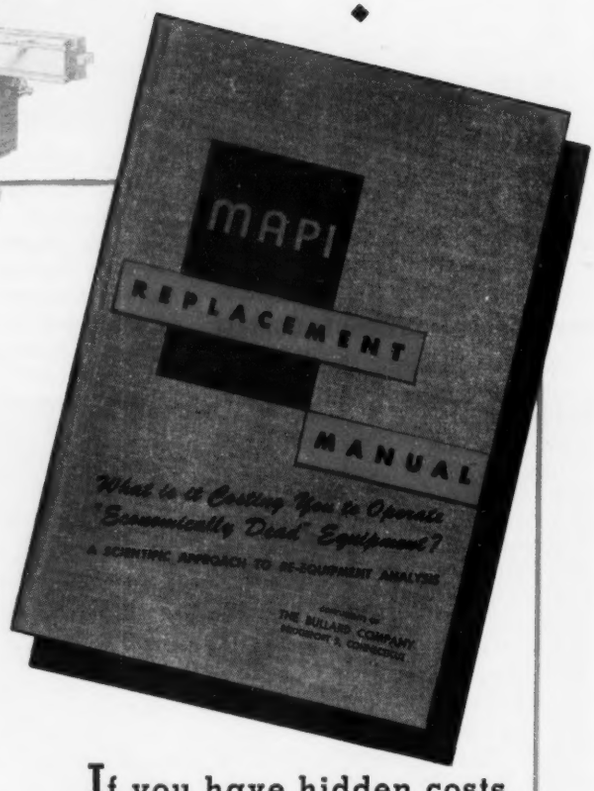
Wrought Iron in Sugar Plant

In a new seven-story building, part of a projected $3 million rehabilitation program of Imperial Sugar Co. at Sugar Land, Tex., the main problem was one of resistance to abrasion rather than to corrosion. So, 130 tons of wrought iron plates, ranging in thickness from 5/16 inch to 1 inch, and an undetermined amount of wrought iron pipe were used in the building. Some of the plates were fabricated into vacuum pans and crystallizers for conversion of sugar cane syrup into massecuite—the concentrated syrup containing sugar that has been crystallized.

Rust Completes Sugar Bin

Rust Engineering Co., Pittsburgh, completed a new 4-million pound sugar storage bin for Colonial Sugars Co. at its Gramercy, La., refinery. The cost was over $100,000. The installation at the refinery includes conveying equipment to handle refined sugar at a 100-ton-per hour rate.

How to make the Invested Dollar Pay More . . . . .



Increased Shop Efficiency through Replacement of Economically tired machines.

Initiative in applying machines to the job.

Development of short cuts and tooling arranged to improve time savings since increased machine efficiency as well as shop efficiency pay more on the Invested Dollar.

Investment in machines of complete flexibility having the potential facilities to adapt themselves to present and future changes of tooling and machining methods———

> Bullard Cut Master meets these conditions and one customer states: "You can do more with a Bullard than you can with———."
>
> In this same customer's plant, a Bullard installation is showing a nice 40% savings over the previous method.

This is only one of many instances where Cut Master lives up to its name.

These machines provide maximum shop efficiency and answer the question, "How to make the Invested Dollar Pay More?"

On request we will be pleased to furnish you with a copy of Mapi Replacement Manual.

If you have hidden costs which are paying for a Cut Master, why not investigate and then have a Cut Master in 30", 36", 42", 54", 64", or 74" size.

THE
BULLARD
COMPANY
BRIDGEPORT 2, CONNECTICUT

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Fisher Body's new Pittsburgh plant will capitalize on both its modernity and location to ship body parts more economically to East Coast assembly units

DETROIT

WHEN flying over the hills of Pittsburgh, there is a new landmark to be sighted—the 60-acre site of Fisher Body's new parts fabricating plant, occupied by a single 15-acre building with 800,000 square feet of floor space. The body-building division of General Motors decided some time ago to set up this plant near sheet and strip producing sources, so that stampings and other steel parts might be shipped more economically to East Coast assembly plants.

Parts for Bodies—The building is a steel structure enclosed with yellow face brick and steel sash in the general office area and with concrete block, steel sash corrugated transite siding in the manufacturing and storage area. Administrative offices occupy first and second floor levels at the front of the building with the manufacturing area to the rear covering 651,800 square feet. It comprises two departments, one devoted to the production of large stamping dies and tools and the other to fabrication of a complete line of panels, roofs and other metal parts used in auto bodies.

A battery of 169 presses handles the stamping operations. Major presses range in capacity from 300 to 1100 tons. In the metal shop, adjoining the press room, are 85 production machines used for welding various parts into assemblies and subassemblies. The toolroom includes 90 machines, ranging from drill presses, lathes, boring mills, milling machines to large size planers. Portable tools, such as grinders, sanders, drills and the like number 350, while dies and welding fixtures assigned to the plant total approximately 900.

Functional Flow—The entire plant is laid out in functional design with sheet steel and other raw materials arriving at the west end, moving eastward by way of cranes to the blanking and shearing equipment and on through the various press lines, finally arriving at the east end of the plant and the 18 railroad-car spur on which the finished parts are loaded for shipment to assembly plants. A total of 47 cranes is installed in the plant, ranging all the way from 1 to 50-ton capacity.

Some statistics on the plant: In building, 72,698 tons of concrete poured and 9430 tons of structural steel erected; electric power consumed in one month equivalent to that used by 930 average type homes; fuel oil for heating equal to that used by 1100 domestic dwellings; fluorescent lighting stretching more than 3 miles; cafeteria serving an average of 1600 meals a day. An interesting footnote is that in excavating the 1,707,277 cubic yards of earth and rock in preparing the plant site, some 500 tons of coal was dug up. Just what happened to the coal is not disclosed, but presumably it was credited to the General Motors treasury which doubtless would find the amount handy to cover its daily bill for paper clips.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
Map	721,161	508,101
June	897,864	523,689
Six Months	3,941,883	3,034,055
July	746,771	604,351
August	844,986*	678,092
September	746,000*	657,073
October		601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
Sept. 16	185,421	159,493
Sept. 23	188,451	158,518
Sept. 30	185,529	151,593
Oct. 7	186,000	148,443

Estimates by Ward's Automotive Reports

* Preliminary.

Chrysler Develops Radiator Cap

A new type radiator cap which provides a sealed pressure cooling system during abnormal driving conditions but which also allows the automobile cooling system to operate at outside atmospheric pressure in normal driving, has been developed by Chrysler engineers.

Lesson in Physics — The boiling point of liquids, of course, varies with the amount of pressure exerted on the liquid surface. Increasing pressure raises the boiling point, and decreasing pressure lowers it. It can be seen, therefore, that by sealing the automobile cooling system and allowing pressure to build up when operating under high temperatures and heavy loads, a definite advantage is gained. The sealed-in pressure permits the engine to operate at temperatures well above normal without causing the cooling agent to boil or evaporate.

Pressure cooling is particularly useful during the changeable temperatures of early and late winter when nonpermanent antifreeze is used in the cooling system. It is also an advantage when pulling a trailer, driving up a steep hill, or in areas where the outside temperature climbs above 100° F and in bumper-to-bumper, stop-and-go traffic where the engine is idling for long periods of time on a warm day.

A Cause of Leaks—When the engine is operating under normal conditions pressure is not required. Yet with conventional radiator pressure caps it occurs in the cooling system at temperatures below the normal atmospheric boiling temperature, constantly exerting a stress throughout the system and increasing the possibility of leaks in the hoses and radiator core. It was to eliminate this condition that the Chrysler radiator cap was developed.

Incorporated in the cap is a special vent valve which controls the amount of pressure in the cooling system. When the temperature in the system rises to the boiling point and pressure cooling is needed, the vent valve is forced shut and seals the cooling system. When operating conditions are normal, however, this valve is open, allowing the pressure inside the system to equalize with outside atmospheric pressure. That takes the constant strain of sealed-in pressure off of the cooling system and especially the radiator core and hoses, and removes the possibility during normal conditions of scalded hands due to the release of hot vapor or liquid when the radiator cap is removed.

Tip Your Cap—In addition, the new radiator cap has been designed to provide safe removal if required

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even under an extreme condition. When being loosened, the cap rises on a slight ramp which permits steam or liquid to pass from under the cap into the radiator filler neck and out the overflow tube before the cap is completely removed.

This safeguard is supplemented by two others: A small but safe amount of steam is permitted to escape around the cap to provide a visual warning that the cooling system is under pressure, and a slight extra force is required to turn the cap past the "stop" position.

Station Wagon in Steel

All-steel station wagon has been introduced by Chrysler in its Town & Country series. It is a four-door body with interior tailored in tolex, a heavy and durable leather-like plastic which can be cleaned readily with soap and water. Highlighting utility features is a folddown arrangement of the rear seat which opens up a level cargo space extending more than 7 feet from behind the front seat to the tailgate. Full rear window extends the entire width of the tailgate and can be lowered into the latter. Spare wheel is carried in a covered well in the floor of the luggage compartment.

Shift from Shifting Continues

Estimates show that only 50 per cent of current passenger car production is being equipped with conventional synchromesh types of transmissions, the rest having either automatic transmissions or overdrives. Automatic transmissions now are being whipped out at a rate of some 50,000 a week, while overdrives run to the surprising total of 30,000 weekly, Borg-Warner Corp. being the sole source. There have been approximately 3.5 million overdrive units built since 1934 and they are claimed to show an economy gain of 20 per cent.

Ford Makes More Promotions

Ford has made further appointments in its manufacturing divisions. The new Chicago aircraft engine division will be headed by Maynard T. Murray who joined the company only last year as manager of quality control and since January has been acting manager of the Canton, O., forge plant.

Marvin L. Katke is now general manager of the automatic transmission division, centered at Cincinnati. Burton O. Heinrich has been given charge of the Canton forge division where he has been serving under Mr. Murray. Edgar F. Wait is the new general manager of the Highland Park division which manufactures trucks and various automotive components. He has been in a supervisory capacity there for a year.

K. J. Puffer becomes general manager of the Mound Road division in Detroit which manufactures driveshafts, front suspension and axle assemblies and miscellaneous chassis parts. David W. Lee is named manager of the tractor and industrial engine division, while H. J. Robinson will continue as manager of tractor manufacturing operations centered at the Highland Park plant.

Willys Capital Hits New High

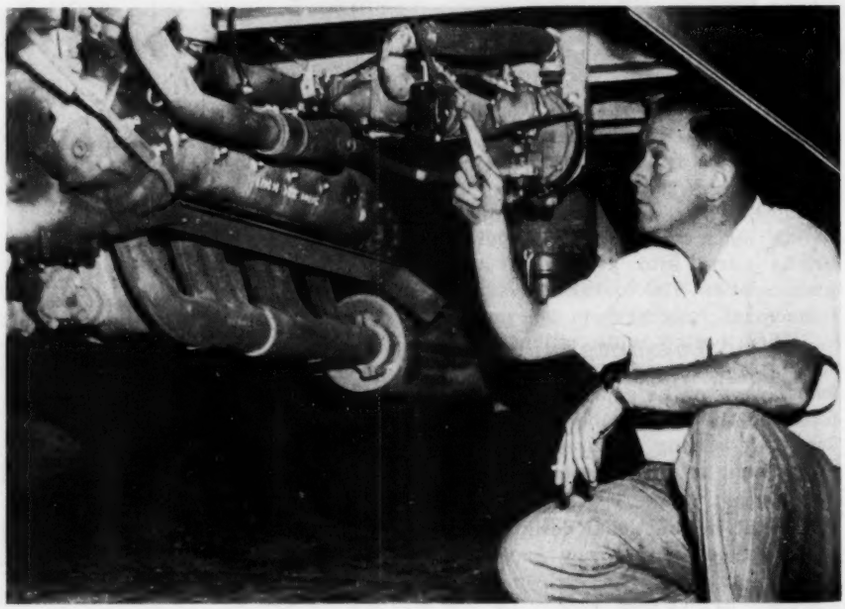
Willys-Overland Motors now has the largest working capital in the 14-year history of the present corporation—better than $27.3 million. The company was one of the nation's 50 largest producers of materiel in the last war.

Colonel Vincent To Retire

Few if any auto industry engineers can boast of 200 patents to their credit, yet such is the distinction of Col. J. G. Vincent, 70-year old executive vice president of Packard, who started as chief engineer of that company in 1912 and who will retire Dec. 31, although continuing as director and engineering consultant. He was appointed Packard vice president of engineering in 1915 and actively directed all designing, research, and other developmental work in connection with the company's automotive, marine engine and aircraft engine projects. He designed the old Packard twin-six back in 1915, first successful diesel aircraft engine, and was a co-designer of the Liberty engine of World War I. From the latter evolved the Packard marine engine, used to power all PT boats in the last war. Finally, the colonel played a key role in perfection of the company's Ultramatic transmission.

Colonel Vincent will be succeeded by Leroy Spencer as vice president, the latter having been vice president and general manager of Earle C. Anthony Inc., Packard distributor in California. His broad experience in merchandising is calculated to give Packard a needed lift in this phase.

While Packard gains on the merchandising front, Ford loses with the resignation of Jack R. Davis, vice president-sales and advertising, ill for several months. Davis is a veteran of both the old and new Ford organizations, starting with the company in 1919 and being named general sales manager in 1937 by the late Henry Ford. A comparatively young executive, his departure marks another instance of the pressure which forces too many automotive top brass into early retirement.



POWER FOR SUPER FREIGHTER: Paul Collins, Twin Coach Co., Kent, O., designer, points to the engine that is slung between the front and rear axles of the new Fageol Super Freighter. The new highway carrier—its body is a standard trailer unit, built by Freuhauf Trailer Co., Detroit, is powered by a Fageol Twin Coach engine. The motorized truck trailer marks the entry of Twin Coach, maker of passenger motor coaches, into the trucking field. An initial model is being shown at the American Trucking Association meeting in New York. L. J. Fageol, president of Twin Coach, says prices are expected to be about 10 per cent lower than those on conventional trucks of like pay-load capacity. Orders have been received already for the trucks

WHEN YOU SPECIFY MILWAUKEE MOLDING MACHINES

Designed by ***experienced foundrymen*** for foundry production operations, MILWAUKEE jolt-squeeze-rollover-draw machines feature maximum production efficiency, simplified control, and a rapid operating cycle.

Three standard sizes are available to meet a wide range of drag-mold production requirements. Maximum flask capacities range from 33 x 32 inches on smallest model to 47 x 47 inches on the largest. Model No. 217 (illustrated) will handle flasks up to 41 x 35 inches in dimension.

MILWAUKEE jolt-squeeze-rollover-draw machines incorporate conveniently located control valves, rigid frames and tie pieces to assure parallel squeeze, cast steel cradle, and a roller conveyor frame that rests on four hydraulic pistons. Jolt mechanism, squeeze cylinder, and leveling device are integral parts of heavy machine base. Flask clamp assemblies are mounted on cradle-ways to facilitate rapid, accurate adjustment, and two aligned rods guide cradle during jolting, squeezing, and pattern draw operations.

With production ***speed*** and ***savings*** the keynotes of today's highly competitive markets, MILWAUKEE molding machines are the most modern equipment available for the production of heavy drag molds of uniform standard. *When you buy, specify MILWAUKEE equipment* . . . and you will have **PRODUCTION PROFITS IN YOUR HANDS! Write for Bulletin No. 115**

Milwaukee-Taccone Model 3-A Core Blower is described in detail in Bulletin 119-A. Operational features of this fully automatic, explosion-type core blower are illustrated by photos and specification charts.

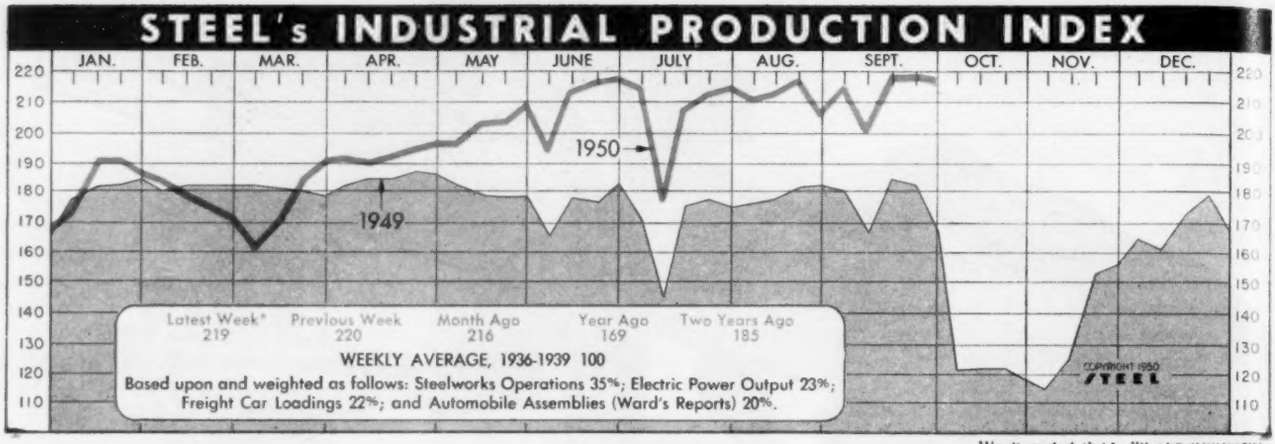
Bulletin 113 contains specification and drawings on 9 types of plain jolt machines, which have capacities ranging up to 10,000 pounds. Dimensions and shipping weights also are listed.

Four models of car-type jolt-squeeze-strip cope making machines are presented in Bulletin 121. Over-all specifications and dimensions, as well as detailed drawing of overhead carriage, are included.

SPO **MILWAUKEE** *Foundry Equipment Division*

CASTINGS ARE PERMANENT

6495 GRAND DIVISION AVENUE • CLEVELAND 5, OHIO


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
220 210 200 190 180 170 160 150 140 130 120 110
1950
1949
Latest Week* 219
Previous Week 220
Month Ago 216
Year Ago 169
Two Years Ago 185
WEEKLY AVERAGE, 1936-1939 100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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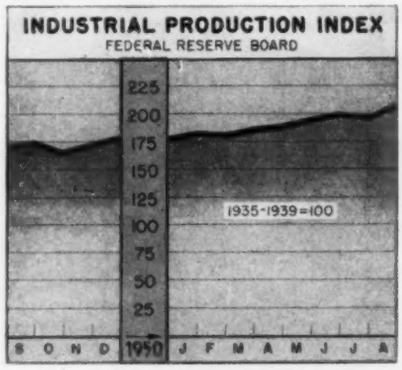
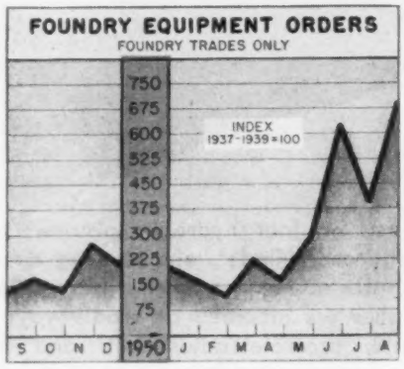
Week ended Sept. 30 (preliminary).




FOUNDRY EQUIPMENT ORDERS
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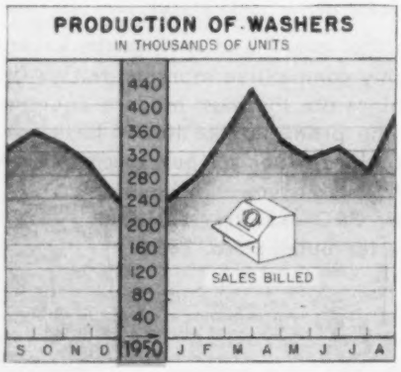


Charts—Copyright 1950, STEEL

Industrial Production Index

	Total Production 1950	Total Production 1949	Iron, Steel 1950	Iron, Steel 1949	Non-ferrous 1950	Non-ferrous 1949
Jan.	183	191	203	228	179	184
Feb.	181	189	201	232	188	185
Mar.	187	184	205	233	199	183
Apr.	190	179	222	219	196	168
May	195	174	226	204	195	145
June	199	169	231	177	207	132
July	196	161	228	156	203	128
Aug.	207	170	234	178	203	141
Sept.	....	174	....	179	....	157
Oct.	....	166	....	103	....	164
Nov.	....	173	....	144	....	163
Dec.	....	180	....	198	....	165
Avg.	....	176	....	187	....	160

Federal Reserve Board

Foundry Equipment Orders

	Index 1950	Index 1949	Value in Thousands 1950	Value in Thousands 1949
Jan.	159.3	149.9	$731	$694
Feb.	113.1	144.4	519	668
Mar.	225.2	190.8	1,034	883
Apr.	160.6	172.0	737	797
May	294.9	121.9	1,353	565
June	622.7	164.9	2,858	764
July	401.8	146.6	1,844	679
Aug.	693.6	127.1	3,183	589
Sept.	....	166.6	....	772
Oct.	....	133.5	....	618
Nov.	....	270.4	....	1,250
Dec.	....	201.0	....	929

Foundry Equipment Mfrs. Assoc.

Household Washers

Sales Billed—Units

	1950	1949	1948
Jan.	275,576	172,400	360,445
Feb.	342,967	201,300	367,909
Mar.	423,802	242,500	408,512
Apr.	333,072	192,500	402,257
May	304,640	211,700	377,895
June	325,217	260,700	392,496
July	282,261	200,900	326,181
Aug.	381,452	323,789	362,169
Sept.	.....	357,281	433,919
Oct.	.....	333,728	382,400
Nov.	.....	298,717	319,300
Dec.	.....	237,591	183,700
Totals	.....	3,033,106	4,317,183

American Washer & Ironer Mfrs. Assoc.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction Sept.25	Ironers Sept.25	Ranges, Gas Oct.2
Durable Goods Sept.25	Machine Tools Oct.2	Refrigerators Sept.25
Employ., Metalwkg.Sept.18	Malleable Iron Oct.2	Steel Castings Aug.21
Employ., Steel Sept.18	Price Indexes Oct.2	Steel Shipments ...Sept.25
Freight Cars Sept.18	Pump Orders Sept.11	Trucks, Elec. Ind...Jan.2
Furnaces, Indus. ..Sept.18	Purchasing Power ..Oct.2	Vacuum Cleaners ..Oct.2
Furnaces, W. Air..Sept.18	Radio, TV Aug.14	Wages, Metalwkg..Sept.18
Gear Sales Sept.11	Ranges, Elec. Sept.25	Water Heaters Sept.11

Production Records Fall

Federal Reserve Board's industrial production index climbed sharply to 207 per cent of the 1935-1939 average in August to set an alltime record but this mark won't stand very long. September's index will be 5 points higher, the board estimates. In August, 1949, the index was 170.

Durable goods production showed a considerable increase in August, reflecting mainly marked increases in the furniture, machinery and iron and steel fabricating industries. Activity at aircraft plants and shipyards also expanded rapidly. Little change was shown in August output of primary metals, bricks, cement and lumber but these industries have operated at advanced levels since spring.

Nondurables shared in August's production spurt. The nondurables index rose to 191, an alltime high and 6 points above the first half level.

Washer Sales in Steep Climb

Household washer factory sales in August jumped almost 100,000 units above the total for one month earlier, showing the effect of the scare buying run on appliances. American Home Laundry Manufacturers' Association reports the August total was 381,452 and was 35.1 per cent above July's 282,261 units. In August, 1949, factory sales aggregated 323,789.

August was the fourth highest month in the industry's history. It was surpassed only by September and October, 1948, with 433,919 and 382,400, respectively, and March, 1950, when the total was 423,802 washers.

Automatic tumbler dryer sales in August aggregated 32,318 units, an increase of 37 per cent over 23,588 in July and almost six times the 5526 reported in August, 1949. Ironer sales in August were 42,700 units. They represent a gain of 70.1 per cent over July's 25,100 units.

The Business Trend

How to hold prices steady while granting wage increases is likely to be a brainbuster for industry to solve if government's action follows present hints

POLITICS will play an important role in whatever controls are used in an attempt to hold down inflation's rising spiral. It's a foregone conclusion some form of controls are in the wind but the exact nature of these controls still isn't clear. If possible a clamp will be put on prices but wages may be allowed to run free for a while. Comments by unidentified Commerce Department economists in recent weeks give a clue that the administration's thinking runs along these channels.

Last week's action by the National Production Authority in setting up a broad priorities system (details on pp. 51 and 52) is only a start. Chances are good that this early action will fall short of doing the job and other directives will be forthcoming soon. Although this action is no surprise, metalworking executives cannot repress a shudder as they think about the mountain of paperwork that is very much a part of their future.

Cutbacks in civilian goods output haven't come yet but some reductions will be necessary before yearend. The NPA order giving the green light to Defense Department and Atomic Energy Commission contracts means an end to business as usual.

Current production figures reflect high level activity in civilian lines particularly in durable goods. The Federal Reserve Board index (at left) is breaking all records. STEEL's industrial production index for the week ended Sept. 30 eased only 1 point to a preliminary 219 per cent of the 1936-1939 average from the alltime high posted in the revised index for one week earlier.

Torrent of Steel . . .

Weekly output of steel for ingots and castings exceeds anything ever recorded. Accurate tonnage figures on weekly steelmaking are not available but capacity is being used to the utmost. In the week ended Sept. 30 the steelmaking rate remained at 101 per cent of capacity for the third consecutive week. The daily average steel tonnage for September should be the highest ever recorded but the monthly total may fall short of a record because of the 30-day month.

Problems for Autos . . .

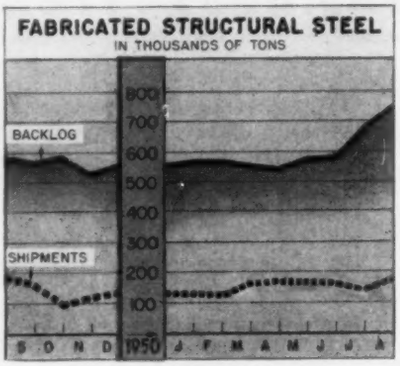
Higher wages and premium prices paid for some raw materials have been absorbed to a considerable degree by the automotive industry through greater productive efficiency. A few auto makers had to boost prices in recent weeks but should steel prices go up then all passenger car and truck prices will climb. This will be doubly certain if materials shortages force a decline in production. October's car and truck assembly schedules call for about 800,000 vehicles to come rolling out of plants in the U. S. To achieve this goal, the auto builders must have a month free of labor disturbances.

Industrial Awards Up . . .

Engineering construction awards for the week ended Sept. 28 totaled $244.8 million and were 6 per cent

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	101.0	101.0	97.5	85.0
	Electric Power Distributed (million kilowatt hours)	6,503	6,457	6,459	5,521
	Bituminous Coal Production (daily av.—1000 tons)	1,900	1,883	1,817	331
	Petroleum Production (daily av.—1000 bbl)	5,903	5,894	5,760	4,950
	Construction Volume (ENR—Unit $1,000,000)	$244.8	$238.9	$342.5	$163.9
	Automobile and Truck Output (Ward's—number units)	185,529	188,451	188,072	151,593
	*Dates on request. †1950 weekly capacity is 1,926,803 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (unit—1000 cars)	858†	870	852	658
	Business Failures (Dun & Bradstreet, number)	148	155	143	181
	Money in Circulation (in millions of dollars)‡	$27,060	$27,081	$27,042	$27,348
	Department Store Sales (changes from like wk. a yr. ago)‡	+10%	+17%	+14%	−8%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$16,249	$18,555	$16,132	$13,071
	Federal Gross Debt (billions)	$256.8	$256.8	$257.8	$256.6
	Bond Volume, NYSE (millions)	$17.9	$20.4	$11.8	$13.6
	Stocks Sales, NYSE (thousands of shares)	10,659	9,901	6,698	6,179
	Loans and Investments (billions)†	$69.6	$68.9	$68.2	$66.5
	United States Gov't. Obligations Held (millions)†	$34,919	$34,840	$34,894	$37,874
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	156.99	156.99	156.99	152.52
	STEEL's Nonferrous Metal Price Index‡	218.3	217.2	205.2	175.9
	All Commodities†	169.4	169.8	167.2	152.4
	Metals and Metal Products†	176.4	176.0	174.8	168.5
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

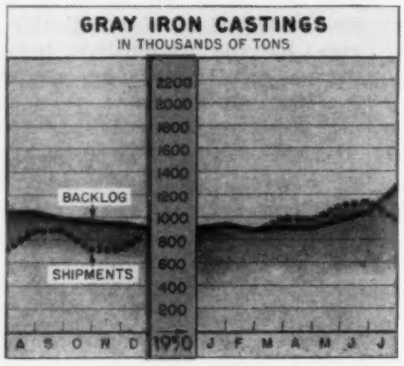


Fabricated Structural Steel

Thousands of Net Tons

	Shipments 1950	Shipments 1949	Backlog 1950	Backlog 1949
Jan.	135.2	152.7	565	675
Feb.	129.6	145.9	565	683
Mar.	156.8	185.9	556	582
Apr.	164.4	179.2	540	628
May	168.1	171.1	578	599
June	172.1	172.3	580	583
July	140.9	148.0	684	605
Aug.	173.1	183.9	741	583
Sept.	....	162.1	...	562
Oct.	....	99.8	...	584
Nov.	....	117.2	...	527
Dec.	....	135.5	...	555
Total	....	1,853.5	...	...

American Institute of Steel Construction

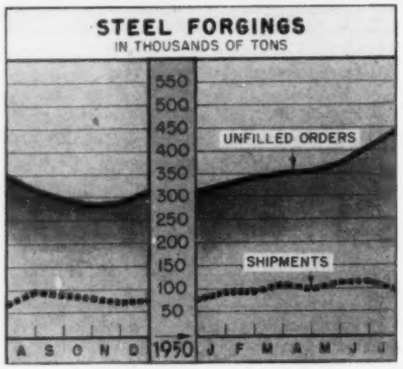


Gray Iron Castings

Thousands of Net Tons

	Shipments 1950	Shipments 1949	Backlogs* 1950	Backlogs* 1949
Jan.	913	1,040	914	2,065
Feb.	864	987	873	1,857
Mar.	996	1,075	922	1,639
Apr.	981	929	922	1,446
May	1,095	867	978	1,243
June	1,136	906	1,040	1,087
July	961	697	1,287	1,032
Aug.	...	872	...	1,048
Sept.	...	881	...	980
Oct.	...	716	...	955
Nov.	...	719	...	939
Dec.	...	862	...	892
Total	...	10,551		

*For Sale. Bureau of the Census



Steel Forgings

Thousands of Tons

	Shipments 1950	Shipments 1949	Unfilled Orders* 1950	Unfilled Orders* 1949
Jan.	93	124	327	571
Feb.	93	111	341	540
Mar.	109	120	350	503
Apr.	99	104	357	465
May	114	92	373	412
June	117	101	408	377
July	95	70	446	348
Aug.	..	96	...	312
Sept.	..	88	...	294
Oct.	..	81	...	280
Nov.	..	73	...	287
Dec.	..	78	...	308

* For Sale. Bureau of the Census.

Charts—Copyright, 1950, STEEL

above the weekly average for this year to date and 49 per cent higher than in the corresponding week a year ago. Industrial building at $54.2 million and commercial building at $33 million were important factors in raising the total. Awards for the year are more than $8964 million and top the 1949 figure for the same period by 46 per cent. Private contracts are up 81 per cent over a year ago and public works are 15 per cent higher.

Enough Fuel . . .

Bureau of Mines says it expects no gasoline or fuel oil shortages this winter in spite of increased demand. It estimates that continuation of refining operations at about the third quarter rate will supply all requirements. The stock situation is materially improved as the result of higher crude runs in August and September.

Natural gas supplies, though somewhat improved through extensive pipeline construction, may not be large enough for all industrial requirements in extremely cold weather. Some paring in industrial usage may be necessary this winter when domestic heating needs reach their peak. Coal stocks are below a year ago and a shortage of freight cars may put the squeeze on industries with coal stockpiles below winter needs. Weekly bituminous coal production is running at more than 11 million tons. In the week ended Sept. 23 it was 11.4 million tons. Total output this year to the date reported was about 353.6 million tons. In the like period a year ago the total was 343.4 million tons.

Spending Spree Continues

Consumer credit reaches all-time high after two months of frenzied buying

ANOTHER large monthly jump in consumer credit is reported by the Federal Reserve Board. The overall increase in credit was a whopping $614 million in August and pushed total consumer credit to an alltime high of $20,979 million. August's increase, although large, did not match July's unprecedented $660 million total.

Installment credit increased $411 million, compared with $500 million in July. Auto credit which rose $101 million in August was less than half the $204 million gain recorded one month earlier. The explanation for the difference in the credit increase in the latest two months reported by the board is contained in this one category.

Not Enough Brake—After the two month's spending records pushed consumer credit to alltime highs, the Federal Reserve Board reimposed controls on consumer credit in mid-September. These controls raised amounts required for down payments on durable lines and reduced time for paying off loans.

The braking effect of these regulations was gentle at best and another new consumer credit record is in the offing when the September total is added to earlier figures. Some easing in credit growth was evident toward the end of August, indicating the frenzy to beat shortages had passed its peak.

Contra-Seasonal Rise—Charge account indebtedness which usually shows little change in August expanded $127 million, about the same as in July. At the end of August charge accounts receivable amounted to $3654 million or $467 million above the amount outstanding a year ago. Total outstanding consumer credit on Aug. 31 was $4526 million more than on the same date in 1949.

Order Peak Passed

Business upswing that began in June reached its peak in August and the rate of increase in new orders was substantially lower in September than a month earlier, reports the National Association of Purchasing Agents' survey committee. Order increases were reported by 21 per cent fewer of companies checked and 10 per cent showed declines in orders.

Production increase turned off by 7 per cent. Despite this change in

trend toward increasing output, backlogs are high and production schedules filled well into the first quarter of 1951. Production would probably continue to increase, the committee believes, if it were possible to get manpower and materials without paying premium prices.

Most purchasing agents believe all-out controls are unneccessary at this time. They say it is still too early to appraise the effect of NPA order No. 1 but most purchasers report they have been unable to maintain practicable working inventories of the restricted items listed in the order in recent weeks.

Effect of war orders so far is negligible. Only 30 per cent of companies report military business and most of these have not been compelled to upset their civilian production.

Prices of course are still spiraling upward. Inventories are trending down but turnover rates are high. Employment is leveling off. Buying policy is generally conservative and based on production needs.

Appliance Prices Advance

Two more companies announce higher appliance prices. International Harvester Co. boosted its refrigerator prices by $10 to $20 and Admiral Corp. advanced refrigerators and electric ranges by $10 to $30.

Emerson Has Record Quarter

Emerson Radio & Phonograph Corp., New York, expects earnings in the current quarter which ends Oct. 31 to be the largest for any like period in history. This quarter also closes the company's fiscal year. Sales for the 12-month period are expected to exceed the $65 million estimate made earlier this year.

Presently sales are zooming along at a $100 million annual rate. Daily output for Emerson is running at about 2200 television receivers and 6000 radio sets.

Portable Tool Sales Spurt

Sales in the third quarter increased at an accelerated rate for Black & Decker Mfg. Co. S. D. Black, president of the Towson, Md., manufacturer of portable electric tools, says domestic sales were stimulated by the rearmament program and particularly by demands from the aircraft industry.

In its foreign operations, the English plant is swamped with orders from all parts of the British Commonwealth and especially from Canada. Dollar sales for the company and its subsidiaries in the third quarter are about 10 per cent ahead of the second quarter and somewhat ahead of a year ago despite differences in calculations caused by foreign currency devaluations.

R.R. Equipment Gets Boost

Improving earnings for railroads will keep buying programs rolling along

RAILROAD equipment replacement, already rolling along at a good clip, will get fuel to maintain speed through increased freight carloadings in the fourth quarter. Reports to the Association of American Railroads by the 13 Regional Shippers Advisory Boards indicate that loadings in the fourth quarter will be 26 per cent higher than in the like period a year ago.

About three-fourths of the gain will be in anticipated loading of coal, coke, ore and iron and steel. Shipments of these commodities were down in the fourth quarter last year because of steel and coal strikes. Estimated increase for other commodities is 8.3 per cent. Quarterly freight carloadings for the last two years and the fourth quarter estimates are shown in the accompanying chart. Except in the first quarter when shipments were down due to the coal strike, this year's carloadings are at or above last year.

No Gold Mine—Railroad earnings in the period since the end of the war have not kept pace with other industries. Record earnings have been recorded by many companies but the railroads have limped along. These low earnings were responsible for the near collapse of the freight car building program. This year after a very poor start railroads have pushed their net incomes higher than in the like period a year ago.

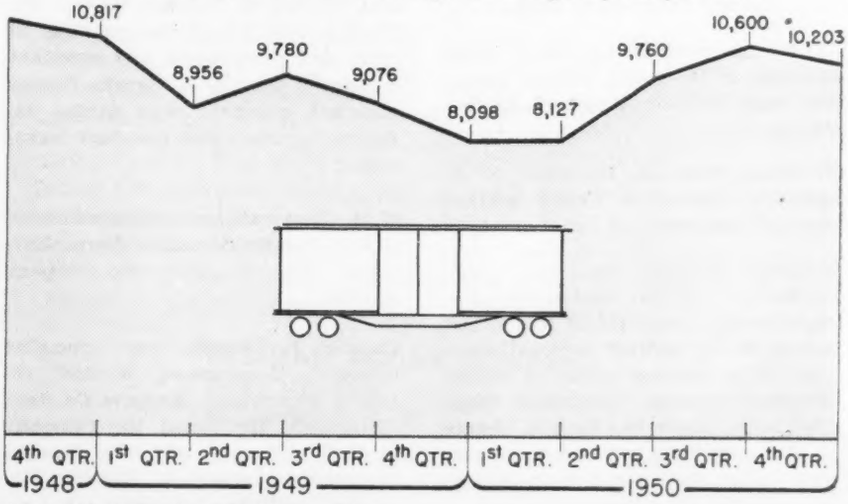
Class I railroads' net incomes in the first eight months this year were about $325 million, compared with $239 million in 1949 and $423 million in 1948. For the first three quarters the net should be near $390 million, topping the corresponding 1949 total by more than $100 million. Higher net income of course means the railroads will be able to keep equipment purchases at higher levels than they were able to do a year ago. They aren't out of the woods yet. Rising wage costs and bigger taxes exert more pressure on the roads than they do on industries with bigger profit margins.

Replacement and Repair—Backlogs for car builders and railroad shops are climbing after new car buying programs were virtually derailed last year. The 67,084-car backlog on Sept. 1 was the highest in more than a year and a half. Both traditional buying methods and the insurance company sponsored plans helped push the total to this level. In addition repair and rebuilding programs are reducing the number of unserviceable cars.

New car deliveries are nearing 6000 per month and about 15,000 cars per month are being put back into shape for service. Still, freight car shortages are reported in various sections. The Interstate Commerce Commission is plugging for allocation of enough steel to build 10,000 cars a month. Some experts say such a monthly total is above current needs and 6000 to 7000 cars per month will be enough to handle shortages within a few months. Whatever total is finally decided upon, shippers had best assume their freight movements may be tight until next summer.

Rising Freight Carloadings Improve Earnings

. . . fourth quarter estimate tops year ago by 26 per cent



* Estimated. Figures in thousands of cars.

Men of Industry

John A. Mitchell, vice president, **Belmont Iron Works,** Philadelphia, succeeds **Joseph G. Shryock,** retired, as president. **A. W. Schede** was elected executive vice president and treasurer, **Harry H. Stahl,** vice president in charge of sales, and **Robert E. Seiffert,** chief engineer. **S. S. Albert,** chairman of the executive committee, and manager of the New York office, will retire Dec. 1 after 45 years of service with this structural fabricating firm.

Townsend Co., New Brighton, Pa., appointed **A. H. Moore** manager of its general sales office to replace **F. J. Kennedy Jr.,** who is assuming other duties.

Taylor-Wharton Iron & Steel Co., High Bridge, N. J., appointed **William F. Williams** vice president-manganese sales and **H. E. Cragin Jr.** assistant vice president-manganese sales. **John P. Reynolds** was appointed assistant sales manager for the company.

John S. Hawley was appointed marketing manager, **Shakeproof Inc.,** division of Illinois Tool Works, Chicago. Before joining Shakeproof he was sales manager, Fanner Mfg. Co., Cleveland.

Ralph L. Robinson, since 1947 assistant vice president, Brake Shoe & Castings and Southern Wheel Divisions, **American Brake Shoe Co.,** New York, and formerly located in St. Louis, has moved to Chicago as vice president of these divisions. **Edward R. Anderson** becomes vice president, Brake Shoe & Castings Division, continuing offices in San Francisco. He became sales manager of the Pacific Coast district in 1947 and vice president, Kellogg Division, in 1949.

A. D. Hodge was appointed sales manager of the newly formed industrial sales division, **Weatherhead Co.,** Cleveland.

Riverside Metal Co., Riverside, N. J., appointed **Egbert A. Cabble** market research analyst.

National Electric Products Corp., Pittsburgh, created within its sales organization a mideastern region and named **H. E. Colliver** regional manager. The regional office is in the Enquirer building, Cincinnati. Since 1947 Mr. Colliver has been in charge of the company's sales of wire, conduit, cable and electrical roughing-in materials throughout Ohio.

ERNEST A. HUND
. . . V. P., Push-Button Foundry Equipment

ROBERT B. ALGIE
. . . joins Forbes Steel as vice president-sales

Ernest A. Hund was named vice president of the newly organized **Push-Button Foundry Equipment Division,** W. G. Reichert Engineering Co., Newark, N. J. With over 25 years' experience in modernization and mechanization of foundries, Mr. Hund had former association in supervisory engineering capacities with Allis-Chalmers Mfg. Co., Beardsley & Piper Co., Link-Belt Co., National Engineering Co., Barber-Green Co., Lester B. Knight, and Productive Equipment Co.

Scott B. Ritchie was elected vice president in charge of operations, **United States Pipe & Foundry Co.,** Burlington, N. J. He succeeds **Richard K. Haughton** who now assumes a new position as production consultant to the president.

D. K. Phillips was appointed secretary and treasurer, **General Fireproofing Co.,** Youngstown, to succeed **William D. Skinner,** retired. Mr. Phillips, who joined the company in 1943, was comptroller and assistant secretary. **Melvin F. Ogram,** former assistant treasurer, was named assistant secretary and assistant treasurer.

H. H. Greenwald was appointed comptroller, **Pacific Airmotive Corp.,** Burbank, Calif. He joined the company in 1945.

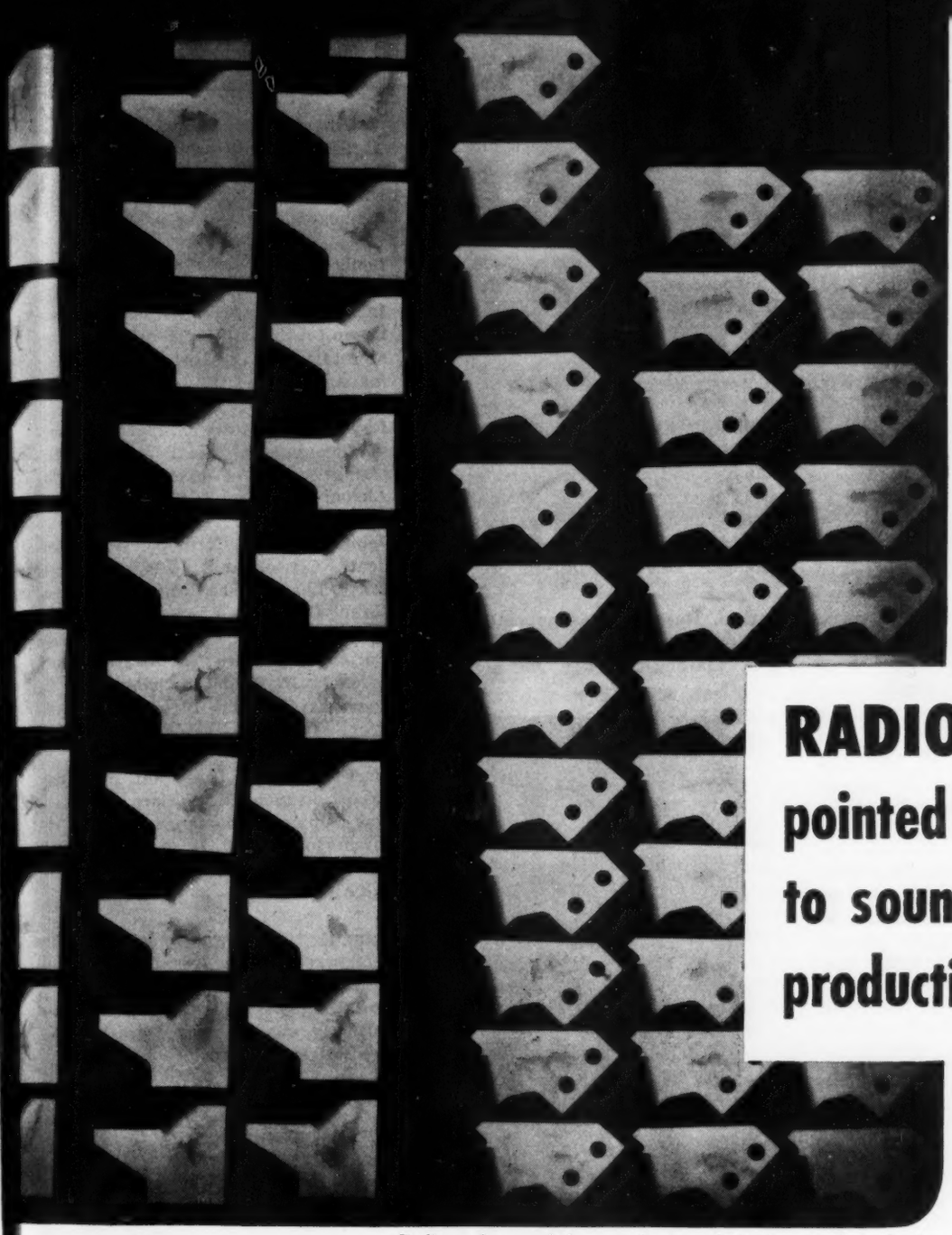
Chester R. Austin was appointed manager, development section, research department, **Koppers Co. Inc.,** Pittsburgh. He joined the company in 1948 and previously was engaged in ceramic research at Battelle Memorial Institute, Columbus, O.

Robert B. Algie was appointed vice president in charge of sales, **Forbes Steel Corp.,** Canonsburg, Pa. He joins Forbes Steel after many years with Jones & Laughlin Steel Corp. where he served most recently as assistant manager of sales, wire products. His activity with Forbes will also be in its wire products line of manufacture, including welded wire fabrics, lawn fence, reinforcing mesh and stampings.

William F. Winemiller, formerly refractories engineer in the Detroit area for **Norton Co.,** Worcester, Mass., was named chief sales engineer, refractories division. He returns to the Worcester plant where he will be responsible to **William H. Henson,** manager, refractories sales engineering department. **Eugene A. Fischer** was named refractories engineer for New England and part of New York state with headquarters in Worcester. **Murner E. Thor** takes over the territory of eastern Canada and part of New York state, and will work out of Buffalo.

Charles B. Lansing Jr. was elected secretary and treasurer, and **William H. North,** assistant secretary of **Ferry Cap & Set Screw Co.,** Cleveland. Mr. Lansing succeeds **H. Allen Hall,** resigned, as secretary. Mr. North continues to handle jobber sales in addition to his other duties.

George D. Ramsay, vice president and technical adviser for **Lone Star Steel Co.,** Dallas, has resigned. He joined Lone Star in 1947 to assist in the blowing in of that firm's east Texas blast furnace. He previously was a consulting engineer on the West



RADIOGRAPHY pointed the way to sound production

Radiography revealed a recurring irregularity in a simple production casting—showing the need for a change in casting procedure.

Simple castings are not always soundly made the first try. These were for a customer who had learned to expect highest quality from the foundry.

The first group cast was checked radiographically. Similar irregularities were found in nearly every part, indicating the need for a change in casting procedure. With the help of radiography the change was made with a minimum of lost time, and sound parts were quickly cast and delivered to the customer.

Any foundry that seeks a reputation for producing consistently sound castings will find radiography an invaluable aid. It detects irregularities. It pictures the effects of changes in gating, venting, pouring temperatures, chilling, and other variables. It pays for itself from savings in development time and in reduced rejections—builds customer good will.

Ask your x-ray dealer to explain all the ways radiography can help you increase yield and cut costs, or ask Kodak for a copy of "Radiography as a Foundry Tool."

EASTMAN KODAK COMPANY
X-ray Division
Rochester 4, N. Y.

Radiography . . .

another important function of photography

Kodak
TRADE-MARK

Coast and plans to return to that practice shortly with offices in Los Angeles.

Curtis A. Haines, formerly general manager, photoflash division, **Sylvania Electric Products Inc.,** New

CURTIS A. HAINES
. . . gen. mgr.-operations, Sylvania divisions

York, was appointed general manager of operations, radio tube division and television picture tube division. In 1946 he was elected president, Wabash Corp., when it became a wholly-owned subsidiary of Sylvania. He was appointed general manager, photoflash division, last year when the Wabash Corp. was absorbed into Sylvania Electric.

Appointment of new vice presidents of **Kaiser Aluminum & Chemical Corp.** and subsidiary, **Kaiser Aluminum & Chemical Sales Inc.,** Oakland, Cal., was announced: **S. S. Inch,** general sales manager, Kaiser Aluminum & Chemical Sales Inc., was named vice president in charge of sales; **Thomas J. Ready Jr.,** assistant general manager, Kaiser Aluminum & Chemical Corp., was appointed vice president; and **Donald E. Browne,** formerly controller, was named vice president and treasurer. **Russell A. Clayton** was appointed controller, Kaiser Aluminum & Chemical Corp.

Frazier & Son, Belleville, N. J., appointed **Irving R. Redland** assistant to the chief engineer in charge of production and sales. He was manager, American Radio Hardware Corp., Mt. Vernon, N. Y.

Herman F. Dobscha was appointed vice president, **H. A. Brassert & Co.,** New York, consulting engineers for the iron and steel industries. Recently manager of the Mingo Junction Works of Wheeling Steel Corp., he had association with the Edgar Thomson blast furnaces at Carnegie-Illinois Steel Corp., and was with Republic Steel Corp. as assistant district manager of the Cleveland district.

Warren H. Farr, vice president in charge of manufacturing, **Budd Co.,** Philadelphia, will resign effective Jan. 1. He will continue as a member of the board of directors, however, and will act as a consultant to the president.

Lockheed Aircraft Corp., Burbank, Calif., appointed **Burt S. Monosmith** manager of manufacturing. He succeeds **Herbert E. Ryker,** resigned to become advisor and special assistant to the vice president and general manager, Hughes Aircraft Co.

Earl C. Hartman was appointed supervisor, coke oven refractories division, **Harbison-Walker Refractories**

EARL C. HARTMAN
. . . directs coke oven refrac. div. at Harbison

Co., Pittsburgh. A member of the company's sales force since 1930, Mr. Hartman has specialized in coke oven refractories for the last 12 years.

Atlas Mineral Products Co., Mertztown, Pa., appointed **Robert P. Desch** as a research chemist.

Leonard C. Yancey and **Frank Storms** were appointed vice presidents of **Iron Mines Co.,** Venezuela, S. A. Mr. Yancey, formerly vice president and manager, Bethlehem Chile Iron Mines Co., takes on additional duties of manager of the Venezuelan operations, while Mr. Storms will be in charge of the Caracas office. Mr. Storms formerly was manager of sales for the Ingersoll-Rand Co. for Venezuela and Colombia, and has spent the last 25 years in these countries.

Edward Ermold Co., New York, manufacturer of bottle labeling and unpacking machinery, appointed **Elmore Riggs** sales representative. He will have headquarters in Milwaukee and will serve Chicago, Milwaukee and Minneapolis.

Louis Rosen was elected president, **Buffalo Sash Weight & Foundry Co. Inc.,** Buffalo. He succeeds **Jacob Rosen,** retired, and is succeeded as secretary by **Leonard S. Kaminker,** manager of the firm.

Raymond L. Fitz was appointed production superintendent in the processing division of **B. F. Goodrich Co.,** Akron.

John E. Barber, formerly vice president, Consolidated Western Steel Corp., Los Angeles, was elected treasurer, **Columbia Steel Co.,** Los Angeles. Both companies are U. S. Steel Corp. subsidiaries. Mr. Barber succeeds **E. H. Daniel,** retiring after 21 years as Columbia Steel Co.'s treasurer.

H. F. Donagher, assistant manager, export division, **Oliver Corp.,** Chicago, was appointed manager of that division to succeed **D. A. Himes,** retired after 47 years of service with the company.

John D. Newell was appointed sales representative for **Joseph T. Ryerson & Son Inc.** in Los Angeles, covering San Diego, Calif., and Arizona. He formerly was an engineer with Lockheed Aircraft Corp.

Richard H. Diesel was appointed di-

RICHARD H. DIESEL
. . . Yale & Towne purchasing dir. at Stamford

rector of purchasing, Stamford division, **Yale & Towne Mfg. Co.,** at Stamford, Conn. He succeeds **A. B. Nordin Jr.,** resigned. Mr. Diesel joined Yale & Towne in 1939 and subsequently served as assistant general sales manager, production manager,

DR. ROBERT W. SANDELIN
. . . heads metallurgical dept. at Connors Steel

SAMUEL M. FELTON
. . . president, Shippers' Car Line Corp.

WALTER S. MARDER
. . . vice president at Daystrom

and recently as executive assistant to the general manager.

Dr. R. W. Sandelin joined **Connors Steel Co.,** Birmingham, to head its metallurgical department. At one time chief metallurgist, Atlantic Steel Co., Atlanta, he later assumed duties as assistant professor of metallurgy, University of Illinois. Dr. Sandelin is a graduate of the University of Minnesota, where he received a Ph. D. in metallurgy.

C. R. Benson was appointed manager of sales, transformer plant in Oakland, Calif., **General Electric Co.,** which is a unit of the GE transformer and allied product divisions.

Samuel M. Felton was elected president and chief executive officer, **Shippers' Car Line Corp.,** subsidiary, American Car & Foundry Co., New York. He succeeds the late **Robert Rogers.** For the last five years Mr. Felton was president, American Railway Car Institute.

Charles W. Wright was elected president, **American Railway Car Institute,** New York, succeeding **Samuel M. Felton,** resigned. Mr. Wright is president of Pullman-Standard Car Export Corp., New York, and has been associated with the car building industry during his entire business career.

Walter S. Marder was elected vice president, **Daystrom Corp.,** Olean, N. Y., manufacturer of tubular steel furniture, and a subsidiary of ATF Inc. Mr. Marder has been associated with ATF for 27 years and for the last three years was with Daystrom, having served the latter as comptroller, and most recently as assistant to the president.

Robert H. Evans was appointed executive assistant to the president and executive committee of **Olin Industries Inc.,** East Alton, Ill.

Great Lakes Steel Corp., Detroit, appointed **Joseph J. Jeffrey** vice precident in charge of personnel.

OBITUARIES . . .

Ransford V. Mann, 62, vice president in charge of sales, **Carpenter Steel Co.,** Reading, Pa., died Sept. 26. He joined the company in 1911 as a sales trainee. In 1941 he was appointed general sales manager and in 1948 assumed the position of vice president-sales. Mr. Mann was widely known as an authority on stainless steel.

Dudley S. Dean, 79, director, **Calumet & Hecla Consolidated Copper Co.,** Boston, and an executive in several mining and land development companies, died Sept. 27 at his home in Cohasset, Mass.

William R. Reid, 71, chairman of the board, **Torrington Co.,** Torrington, Conn., died Sept. 16. He had been with the company 50 years, 22 of which he served as president. He was board chairman for the last four years.

Francis E. Bash, 57, vice president in charge of the technical department of **Driver-Harris Co.,** Harrison, N. J., died Sept. 14. A chemical engineer and metallurgist, he was well known for his metallurgical experiments and developments during the last 27 years.

Frank D. Anderson, 54, one of the founders of **Superior Casting Co.,** Los Angeles, and a developer of aluminum tooling plate used largely by the aircraft industry, died Sept. 21. He had been currently employed as a field engineer with Ace Tooling & Engineering Co., Los Angeles.

Paul H. Haller Jr., former general accountant, **United States Steel Corp.,** New York, died Sept. 25 in Poughkeepsie, N. Y. He retired April, 1950, after 48 years of continuous service with the company.

Frank E. McIntyre, 78, who retired in 1930 after 30 years as general foundry superintendent for the former **National Brake & Electric Co.,** Milwaukee, died Sept. 21.

William L. Allen, 61, consulting engineer and former president of **Sheffield Steel Co.,** died in Kansas City Sept. 27 of a heart attack. He assisted Jesse Jones, then RFC head, in converting the nation's steel industry to a wartime-status in 1941. He quit his office in New York at the start of the Korean crisis to assist in the same capacity.

Harry L. Gellinger, 64, retired vice president and director, **Crucible Steel Co. of America,** New York, died Sept. 24 while on vacation at Daytona Beach, Fla.

Walter Mickelson, 63, chief engineer, **Hasco Valve & Machine Co.,** Milwaukee, died Sept. 23.

A. L. Wagoner, 65, who retired in April as purchasing agent, **General Electric Co.,** Schenectady, N. Y., after 43 years of service with the company, died Sept. 28.

George H. Taylor, 60, secretary and a director, **Taylor Instrument Cos.,** Rochester, N. Y., died Sept. 30.

Samuel M. Dillon, 78, president, **Wilmington Sash & Door Co.,** Wilmington, Del., died Sept. 23.

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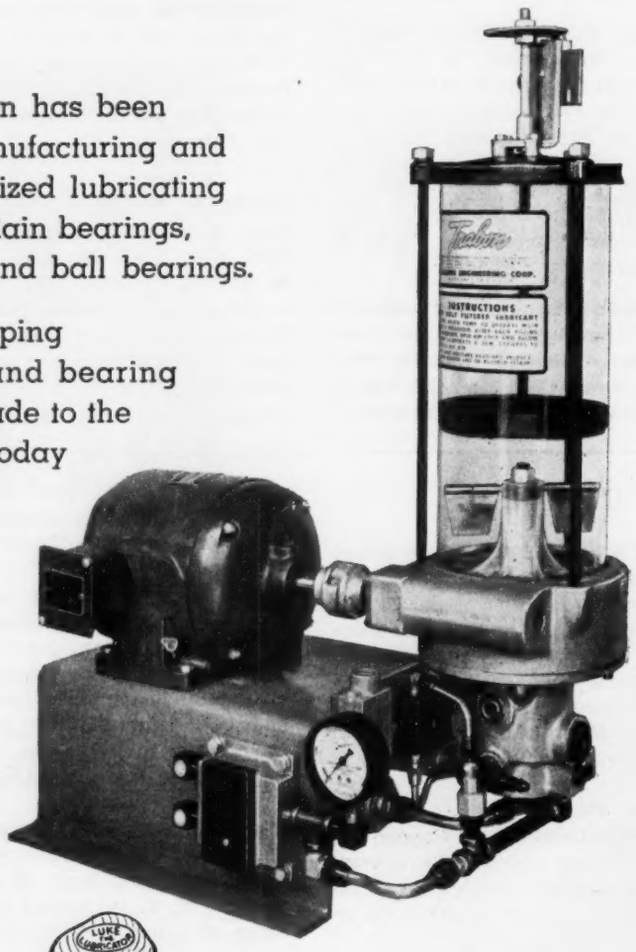

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Production AND Engineering
NEWS AT A GLANCE

MORE LIFE FOR TOOLS— Service life of high-speed drills, cutting edges and wearing surfaces of dies, molds, and cams is substantially increased by a new fast-acting case hardening compound reported by Doughty Laboratories, New York. According to the company, application of the compound to metal surfaces provides both a nitriding chromizing and carburizing effect. The resulting metallurgical changes greatly improve the structural quality, hardness and wear resistance of the metals. A soft 1020 carbon steel, for example, can be raised to a hardness of about 60 Rockwell C or around 600 Brinell.

"GROUND" RESISTANCE MEASURED— Direct measurement of insulation resistance or "grounds" in a normally ungrounded electrical system, whether nonenergized or energized with alternating or direct current is now possible with instruments developed by the Naval Research Laboratory. According to the Department of Defense, Washington, one instrument is a manual ground detector, the other an automatic device that employs a servo system to actuate the balancing circuit. Conventional detectors either are not direct reading or do not apply to energized systems.

CROSS-HOLE DRILLING STEPPED UP— Cross holes can be drilled at a rate of up to 1000 per hour by a setup of automatic drilling units devised by Govro-Nelson Co., Detroit. Originally designed for drilling cross holes in seven different size fishing tackle swivels, the method can be adapted for parts of varying sizes and shapes. The setup includes two drilling units that operate simultaneously. It also is designed so the work can be clamped or unclamped automatically.

AIRCRAFT PRODUCTION GETS LIFT— A new forging process which eliminates riveting reinforcements in the manufacture of aircraft wing panels has been developed by the Air Materiel Command in conjunction with industry. Many man-hours as well as cost of rivets are saved in the operation. Specially designed dies and a vertical hydraulic press are employed to forge intergrally-stiffened wing skins ⅛-inch thick, making strengthening unnecessary. Aluminum loss also is nil.

STAINLESS IN COLORS— If you want stainless steel in colors you soon may be able to get it. The government patent office says that stainless steel in many colors for ornamental use and for interior fixtures and furniture varies from yellow through green and blue to purple when treated chemically in a process described in a new patent. The patent, No. 2,521,580, was issued to Regina L. Hornak, Baltimore, and John J. Halbig, Middletown, O. Rights are assigned to Armco Steel Corp.

PRINTED CIRCUIT PRODUCTION IMPROVED— Advanced methods of producing printed circuits and subminiature assemblies to speed electronic manufacturing are included in two new Bureau of Standard reports prepared for the Navy's Bureau of Aeronautics. The reports are the result of the bureau's scientific efforts to advance the art of producing improved, smaller electronic equipment. Since 1946 when printed circuits came into prominence considerable laboratory and industry experience has been accumulated with circuit printing techniques.

FAST GEAR DEBURRING — Old hand method of deburring gears now can virtually be thrown out the window. A new mass production method developed by Osborn Mfg. Co., Cleveland, makes it possible for a "green" operator to turn out 200 gears per hour. The technique, which involves a semiautomatic universal workpiece holder and brushing lathe setup, removes burrs and sharp edges from a gear in about 18 seconds. Tool marks, scratches and other flaws also are greatly minimized to eliminate possibility of weak spots leading to fractures. (p. 80)

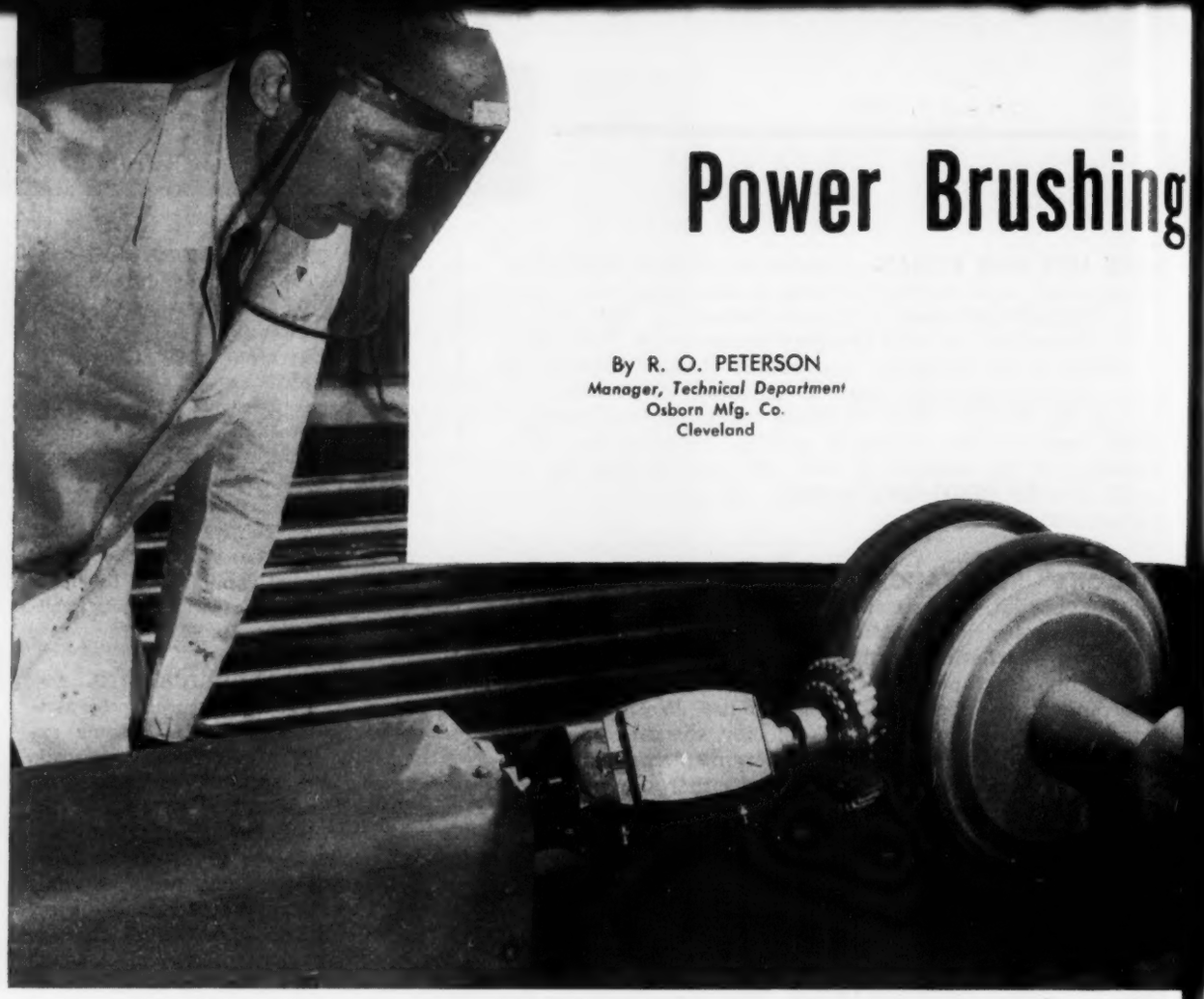
SEEK METALLURGICAL AID—Aircraft designers are turning to metallurgists for answers to some extremely difficult structural materials problems presented by modern, faster flying aircraft. The Air Force, for example, is engaged in a realistic research and development program involving "newer" structural materials such as certain magnesium alloys and titanium. Gen. Dent Jr. of the Air Materiel Command, Dayton, O., points out that whenever it is possible to substitute titanium gage for gage for stainless steel, a 40 per cent savings in weight occurs. (p. 82)

"TOLL GATE" PLAN—In setting up an inspection procedure, one method to follow is the sampling table or "toll gate" plan—one in which the sampling table is set up in the manufacturing area close to the natural production line flow. By having the work sent to this table from each machine once every half hour or once an hour, several psychological as well as practical advantages are gained. For example, the system supplies what the machine operator craves—an impartial and timely answer to the question "How'm I doing"? It also highlights incompetent machines, tooling or puts the finger on careless operators. (p. 86)

SPEEDS PATTERN MAKING—Here is one instance where wartime experience hit the jackpot. A Meadville, Pa., man who spent a lot of time building oddly-contoured alcohol and water tanks to fit available spaces in submarines, developed a method by which patterns for such jobs can be made in 15 to 20 minutes. Pattern tool he devised eliminates both drawing board drudgery and slide rule mathematics. (p. 100)

Power Brushing De

By R. O. PETERSON
Manager, Technical Department
Osborn Mfg. Co.
Cleveland



In a production run, a new operator using the Osborn workpiece holder was able to finish 200 gears per hour, compared to 20 by the old hand method. The holder rotates the gear and presents it to the brush face. Operator simply loads and unloads

TEN TIMES the work previously turned out by hand is processed by a new mass production method of deburring gears and similar shaped products. The versatile technique involves a semiautomatic universal workpiece holder and brushing lathe setup developed by Osborn Mfg. Co.

200 Gears per Hour—In a series of production runs supervised by the Osborn technical department, a new operator using one version of the brushing method was able to finish 200 gears per hour. With hand methods, utilizing a hard hand tool, a trained operator finished only 20 gears during the same period. Not only was there a 900 per cent production increase, but, according to the standards set by the brushed gears, none of the 20 gears finished by hand would have passed inspection.

Application of power brushing to burr-removal work has increased many times. In the past, tooling up for the production of many machine parts completely neglected the consideration of removing burrs, sharp edges, tool marks, and metallic detritus. The selection of methods for doing this work was often left to an operator. Consequently, slow laborious methods became accepted standards and much time and labor was lost unintentionally.

With demand for both increased quantity and quality production, many plants found that the burr removing departments would bottleneck many others as production increased. For this reason, as well as to obtain necessary high quality production with minimum costs, methods in this field were investigated.

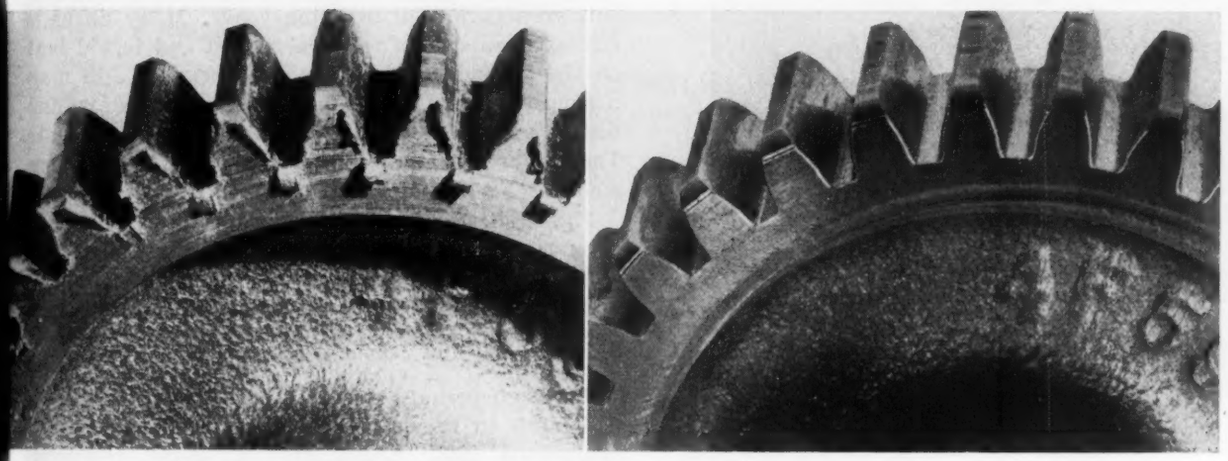
Operators' Job Simplified—Operation of the Osborn workpiece holder is so easily learned that an unskilled operator can attain high quality, rapid production quickly. The entire job of the operator is placing the gear on the holder. Once this is done, his job is complete until the gear is brushed.

The holder rotates the gear and presents it to the brush. A preset timer retracts the holder and the motion is stopped until again actuated by the operator. The amount, direction and quality of brushing each gear receives, depends on the type of gear, metal, surface desired and type and method of application of the brushes. The operator simply loads and unloads. All other operations can be predetermined and preset.

Stress Concentrations Cause Fractures — Primary cause of as high as 80 per cent of the troubles of well-designed machine parts is due to stress concentrations and resulting progressive fractures. Fractures occur usually at sharp edges and abrupt changes of cross-section, where the V-notch effect of tool marks, scratches and flaws have presented the

Deburrs Gears Ten Times Faster

A new semiautomatic workpiece holder and brushing lathe setup finishes gears and other similar products on a fast, high quality production line basis



Left—Gear before rapid brushing to remove burrs and sharp edges. Right—Same gear after rapid brushing. Each gear is finished in 18 seconds including handling time, compared to 3 minutes with a hard hand tool. Brushes do not produce a secondary burr or create two sharp edges in place of one removed

opportunity for the stress to exceed the strength of the material.

Some investigators have shown that a sharp corner or edge may reduce the endurance limits of a part as much as 50 per cent. A distinct V notch, such as would be made with a hard tool, may reduce the endurance limit as much as 60 per cent. This reduction, traceable to the concentration of stresses, can be minimized effectively by brushing.

Surfaces Blended — While removing the burrs, brushes can produce simultaneously smooth surfaces and well rounded edges. Tool and grinding marks as well as intersecting surfaces can be blended, reducing the number of potential starting points for small cracks. These small cracks may not cause complete fracture, but will result in small burrs and metal breaking off that will foul the lubrication system and cause unnecessary wear.

Fineness of the finish is determined by the type of brush and auxiliary compound used. The action of brushing is that of blending surface irregularities, rather than actual removal of metal. Surface analyzer readings may show surface roughness of 24 to 35 microinches before brushing; the readings may be reduced to from 4 to 7 microinches after brushing.

Wide Range of Gear Sizes Processed—The new Osborn brushing lathe is adaptable to many practical sizes of brushes and can be used on a wide range of gear sizes. Operation of the lathe solves the problem of a dull brush. Conventional designs of lathes and brushes will not do the job; special designs are required. Through variation of the gage of the brush fill wire and other brush material, it is usually possible to adapt them to all metals.

Special brushes with fiber fill are also efficient for burr removing and are frequently used on precision parts where the finish of adjacent surfaces must be maintained or improved. These brushes must be used especially on ductile metals, such as stainless steel, in those cases where the brushing action of wire brushes will peen the burr instead of removing it.

It is impossible, at this time, to estimate the money savings the metalworking industry will be able to realize through use of these new developments. The time saved by these methods for industry could be many thousands of manhours. This is more than an estimate. It is a mathematical fact obtained by taking the difference between the time expended with the old hand method (3 minutes per gear) and the time used for finishing the gear with the new Osborn method (18 seconds)—a saving of 2 minutes 42 seconds per gear.

Aircraft Designers Look to "N

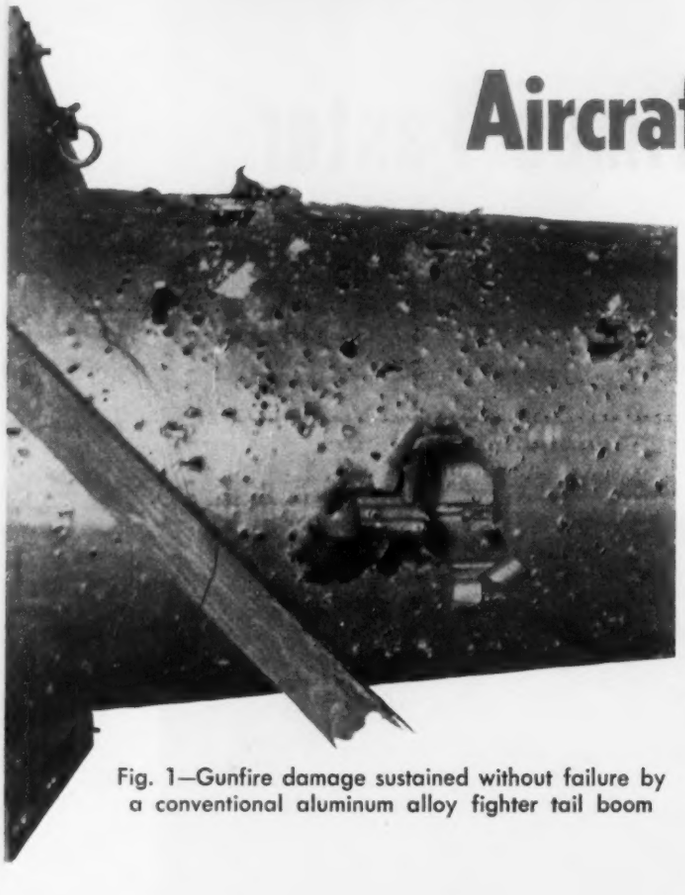


Fig. 1—Gunfire damage sustained without failure by a conventional aluminum alloy fighter tail boom

AIRCRAFT designers are turning to metallurgists for answers to some extremely difficult structural materials problems presented by modern aircraft. Aerodynamic heating of the structure, highly critical structural weight of increasingly large aircraft and greater tortional bending rigidity requirements are some of the factors responsible for the engineers' headaches.

To meet these problems, the Air Force is engaged in a realistic research and development program involving the "newer" structural materials such as certain magnesium alloys and titanium, and some novel fabricating techniques. Last March, the Air Forces' Brig. Gen. Fred R. Dent Jr., of the Air Materiel Command, Wright-Patterson Air Force Base, Dayton, O., discussed trends in the program before the Pittsburgh Chapter, American Society for Metals. What the general said six months ago has taken on new significance in the light of subsequent military developments.

Magnesium Supply Inexhaustible — Typical basic structure of combat aircraft today, with a few noteworthy exceptions, he says, is practically 100 per cent aluminum. This country's bauxite ore potential, while by no means exhausted, is down to lower grade ores which are more difficult and more costly to refine. In contrast, basic magnesium, taken from sea, exists in an inexhaustible supply.

Many factors retarded the application of magnesium to aircraft primary structures. Probably lack of experience of the aircraft industry is the greatest. Recall the hesitancy of the aircraft industry to change from wood to aluminum. There were also technical problems of ductility, corrosion resistance, and fabrication techniques. Fortunately, most hindrances, with the exception of widespread industry inexperience, no longer exist today.

New Alloy Satisfactory—The Air Force development program on magnesium, General Dent points out, goes back well over ten years. Many different aircraft components were fabricated and tested both on the ground and in flight. The original J-lh magnesium alloy was not suitable because of its low ductility. Fatigue and gunfire resistance were inadequate. These shortcomings were overcome with the development of FS-lh magnesium alloy.

Fig. 1 shows damage sustained without failure by a conventional aluminum alloy fighter tail boom.

Unsatisfactory gunfire resistance of a substitute magnesium tail boom is illustrated in Fig. 3. Low ductility and notch sensitivity of the J-lh material are obvious.

Although perhaps not quite comparable in gunfire resistance to the aluminum alloy boom, this FS-lh magnesium alloy boom, Fig. 2, shows resistance which is considered adequate.

Ten complete sets of outer wing panels were fabricated from this new alloy. Some received as much as 2000 flight hours with satisfactory results.

Thick Skin Design Used—In continuing development of magnesium alloys in the primary structure of combat type aircraft, a particular primary structural component was selected which included magnesium sheet, castings and extrusions.

The design was a radical departure from the conventional sheetstringer construction normally employed. Taking advantage of the greatly increased sectional modulus available in magnesium, a thick skin design was used which, in addition to its high structural efficiency, produced several overall advantages.

Both the conventional aluminum alloy wing and the magnesium wing, for example, utilize a two-spar design and weigh approximately the same. The aluminum wing distributes the span-wise bending loads in proportions of about 66 per cent in the spar caps and 34 per cent in the skin and stiffeners. The magnesium wing reverses this procedure and absorbs only 34 per cent of the bending loads in the spar caps and carries 66 per cent in the sheet skin alone, since there are no stiffeners. The heaviest skin gage on the original wing was 0.051. The magnesium wing utilized skin from 0.064 to 0.375.

Number of Fastenings Cut—The large station 0 bulkhead of the craft, which is the most heavily loaded, was originally made up of 25 separate pieces

"Newer" Structural Metals

As airplanes get bigger, fly faster, higher and farther, designers must dig deeper in their search for suitable structural materials. Aeronautical research and development trends indicate important roles for magnesium alloys, titanium, sandwich construction, rolled tapered sheet, thin integrally stiffened sheet, tapered extrusions, structural adhesives and high-temperature materials for engines

and 653 fastenings. This member was redesigned as a one-piece magnesium casting, eliminating many fastenings. The original aluminum alloy wing consisted of 1640 separate parts and 42,700 fastenings.

The magnesium alloy wing employs 508 pieces and 16,000 fastenings; i. e., it has only 31 per cent of the number of parts and 38 per cent of the number of fastenings required in the original conventional aluminum alloy wing.

A thick wing possesses valuable aerodynamic advantages in maintaining accurate wing contours. Under static tests, the magnesium wing did not buckle until above flight operating loads. No dimpling was required throughout the skin thickness range employed, and machine countersinking was possible throughout the structure. Fatigue cracking of thin sheet around rivets was also minimized.

Fuel Capacity Increased—The elimination of most internal stiffeners in the magnesium wing also increases the internal volume available for fuel, to the point where an 18 per cent increase in range is achieved.

Gunfire tests indicated that the shock resistance of the magnesium wing should be at least equal to the resistance of 75S-T aluminum alloy.

An increase in torsional rigidity of approximately 50 per cent over that of the conventional wing was observed in static tests.

The B-36 makes extensive use of magnesium alloys. A large portion of the wing surface aft of the rear spar would have suffered a severe weight penalty because of minimum gage requirements, had not magnesium been effectively employed.

Titanium Looks Promising—Another material that looks promising is titanium. Commercially pure titanium is light, strong, ductile and corrosion resistant. Insofar as density, modulus, and strength at intermediate temperatures are concerned, it fills a gap between the aluminum alloys and the stainless steels. Ore reserves on the North American continent place titanium in a very favorable position. On a strength-weight basis, cold-worked titanium and titanium alloys are equal or superior to the best of other materials. Based on elastic buckling of slender columns, it is superior to steel, but inferior to aluminum or magnesium.

Magnesium and aluminum are not considered as having any useful load-carrying ability at temperatures above 600° F. Titanium has useful creep strength at temperatures as high as 1000° F. Limited room temperature fatigue data indicate that forged titanium has an endurance limit 50 per cent or more of the tensile strength of the material.

Weight Savings 40 Per Cent—Wherever it is possible to substitute titanium, gage for gage, for stainless steel, a 40 per cent savings in weight occurs. Portions of aircraft structure immediately surrounding jet engines, tailpipes, and particularly afterburner installations, must in many cases be fabricated from a corrosion and heat resistant material.

A recent study indicated that a weight savings of 1200 pounds could be realized by the direct substitution of titanium for stainless steel. This means that the gross weight of the airplane can be reduced by

Fig. 2—Although not comparable in gunfire resistance to the aluminum boom, this FS-lh magnesium alloy boom shows resistance which is considered adequate

almost 5 tons. Even at the current price of titanium, this substitution is economically sound.

Simpler Production Method Needed—A simpler, more rapid, and less expensive method of producing titanium metal from the basic ore is needed. Continued research should produce titanium alloys of greater strength and more desirable characteristics.

Sandwich Construction Studied—Another field of continuing development is that of sandwich structures. By the use of relatively thin, high strength, inner and outer faces, properly spaced and adequately supported by bonding to a low density core, a very high structural efficiency can be attained. A structure such as a wing may employ a "sandwich" for each of the upper and lower skins, or may be a single sandwich with the core completely filling the wing.

Sandwich construction is possible using various materials for the faces and cores. Face materials can be any of the commonly used metals such as aluminum, magnesium, or steel. Core materials may be balsa wood, laminated plastic honeycomb, or aluminum foil honeycomb. In each case, the faces are bonded to the core by structural adhesives.

Sandwich construction shows promise when applied to structures requiring high torsional rigidity (such as bomb bay doors) in which low deflections are of primary importance.

Steel Availability May Be Serious—In contemplating the production which would be required for maximum utilization of missiles under wartime conditions, the steel availability problem is likely to be serious. Use of critical and strategic materials must definitely be avoided wherever possible. Add to the requirement the fact that most of the materials going into missile fabrication are scheduled for a one-way trip and cannot be reclaimed even as scrap. The problem of material conservation is not being overlooked.

Low carbon steels can be used as the major element of construction, without serious penalties in weight or design features, and without sacrificing qualities.

Rolled Tapered Sheet Investigated—Another development in which the Air Force has been actively associated is that of rolled tapered sheet. Tapered sheet is advantageous in the design and fabrication of efficient structural components. The development of production processes appears very promising. For example, 75S-T aluminum alloy sheet has been produced with a uniform taper in thickness from ¼ to 1/16-inch in a length of 9 feet.

Methods of rolling thin, integrally stiffened sheet are also being investigated. An example would be a sheet 0.040-inch thick with raised 5/16-inch longitudinal stiffeners spaced every 1½-inches throughout the width of the sheet. Integrally stiffened sheets would eliminate the assembly of separate stiffeners to a sheet and would be more efficient structurally.

Still another recent development is that of producing tapered extrusions. Tapered extrusions, from the structural designers' standpoint, go hand in hand with tapered sheet, the highest efficiency being realized with a combination of the two.

Structural Adhesives Important — Structural adhesives are playing an ever increasing role in primary structures. The Air Force first took an active interest in structural adhesives in 1939. Preliminary tests on the initially developed adhesive, known as the "cycle-weld" process, showed that, when used to make a lap joint of 24S-T aluminum, a shear strength of approximately 700 psi could be developed.

Under an accelerated development program, the strength of cycle-weld adhesives was gradually increased until tests showed constant shear strengths of about 3000 psi and tensile strengths of 1200 psi.

Gives Better Fatigue Strength — Laboratory tests indicate that a continuous adhesive bond affords considerably increased fatigue strength. The continuous bonded areas also are capable of increasing the compressive buckling load which a sheet-stiffener panel can sustain, since normally a sheet tends to buckle locally between rivets or spot-welds.

Structural adhesives have been advantageously used in the B-36 airplane. Without continuous bonding, the extensive use of thin gages of magnesium sheet would have been impractical because of fatigue susceptibility, mainly due to the cracking of sheets around rivets.

The Air Force is currently trying to develop a high-temperature structural adhesive which will be required for the assembly of structures subject to aerodynamic heating. The present state of this development has produced adhesives with moderate strengths at 400° F. These strengths are expected to increase.

Materials Limit Engine Design—One of the primary limitations in the design of engines for military aircraft is the availability of suitable materials.

During the past decade, the permissible operating temperatures of metals and metal alloys have increased from 1000 to approximately 1500° F. These temperatures may be still further increased several hundred degrees through careful design and processing. However, the melting point of current alloys established definite ceiling limits.

Working temperatures of above 2000° F are desirable in many gas turbine engine designs, and above 5000° F is desirable in rockets. Fortunately, several alleviating possibilities exist, some of which include the use of special cooling provisions, ceramic coated metals, metal ceramic materials, and ceramics.

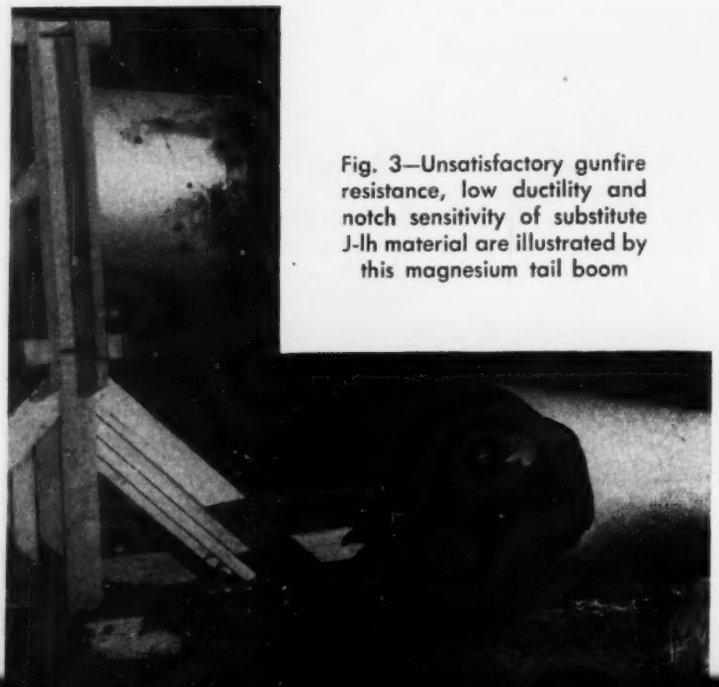


Fig. 3—Unsatisfactory gunfire resistance, low ductility and notch sensitivity of substitute J-lh material are illustrated by this magnesium tail boom

SEEN AND HEARD IN THE *Machinery Field*

By GUY HUBBARD
Machine Tool Editor

"PRE-MACHINING" OF METAL: I explored the big exposition staged by the Association of Iron and Steel Engineers held in Public Hall, Cleveland, during the week of September 26, 1950, primarily to discover what AISE has contributed to machine shop practice and what machine shop practice has contributed to AISE.

As usual in similar investigations of American industry, I discerned far more interlocking of steelmaking and steel machining activities than generally is realized by steel mill men and machine shop men. This interlocking of interests benefits both groups. Without it mass production of metal products never could have developed as it has here in the United States.

Take for example, what I have chosen to call the "pre-machining" of metal by rolling and drawing. I can remember when continuous rolling of wide, accurate, highly finished strip steel was much more of a dream than a reality. Also, I can remember when accurate, highly finished cold rolled or drawn bar stock of large diameter was more of a dream than it was a reality. Today we take these materials for granted. Our whole system of mass production is built around the availability of these cheap, accurately "pre-machined" materials. That goes for punch press practice, automatic screw machine practice and numerous other production practices. Machining and finishing operations thus eliminated save untold time and money.

After conversations with experienced rolling mill men, I realize that they too owe a lot to what machine tool builders have done—not only in making available big, accurate machine tools suitable for machining big frames, etc., but also in developing new and better techniques of roll turning and roll grinding. These include new methods and machines for fast, accurate "contouring" of rolls. Also improved methods for "mirror finish" grinding of rolls for highly finished sheet and strip.

These are concrete examples of why machine tools are called "machines which build machines." On the other hand, these machines which they build, in turn add immeasurably to the efficiency of production machine tools by feeding to them pre-finished stock which speeds up their output, improves their products and relieves them of the wear and tear of "roughing" operations. This whole thing constitutes a highly interesting and effective technological-economic cycle.

X-RAYS OF AILING MACHINES: When Diogenes used a lantern to seek an honest man, he little dreamed that thinkers of another day and age would devise a "lantern" that would detect dishonest mechanisms. Eastman Kodak Co. now calls attention to the fact that radiography can go far beyond mere inspection of castings and welds. It can be used to "look inside" mechanical assemblies so that internal troubles can be diagnosed without disassembly.

Eastman cites a case where two of a group of complicated hydraulic mechanisms failed to function properly. Disassembly of the entire mechanism would have been costly and would have involved breaking seals. Radiography made it possible to compare the "innards" of a good unit with those of the faulty ones. The comparison revealed that compression springs were rubbing on cylinder walls and that springs were missing in the valve compartments, which made the malfunctioning quite understandable.

This technique is similar to that which has been practiced by doctors and dentists for nearly 50 years. If its boons are as great in connection with the ailments of modern complicated machines, as they have been in connection with those of human beings we are due to see x-ray equipment become standard equipment on assembly and testing floors. This is typical of the continuing march of scientific apparatus out of the laboratory into the shop. This is one of the surest signs that American industry is marching on toward greater achievements.

REALISM OF MAINTENANCE: One of the bones of contention between production users of metalworking machines and builders thereof, long has been "servicing convenience". To the user, this term "servicing" covers repairs as well as adjustments—both of which hold possibilities of costly tieups on production lines.

Machinery builders realize that repairs and adjustments under high pressure production conditions—especially in plants that run right around the clock—are inevitable. Some of them come right out and admit it. One of these is E. W. Bliss Co.

In the current announcement of its new line of four-point, under driven, eccentric presses, designed primarily for production line use in automotive and appliance industries the Bliss people emphasize "realistic provisions for maintenance and adjustment". For instance, "—all bearings are arranged to permit shafts to be dropped straight down, without pulling". Also, "—the clutch does not require adjustment for wear. When worn, its friction plates are quickly removed and replaced without disassembling the clutch"

Bliss designers—in co-operation with automotive engineers—have sought to make these presses just as rugged and durable as is humanly possible to make them. However, they don't promise that a bit of "doctoring" may not be necessary now and then. What they do promise is that the treatments will be simple and that the cures will be quick. This appeals to me as solid salesmanship.

Lift Output Through Quality Control

Small as well as large companies find these methods minimize rejects, improve manufacturing efficiency, spark sales effort, reduce service costs and build good will among customers

By C. W. KENNEDY
Quality Control Engineer
Federal Products Corp.
Providence, R. I.

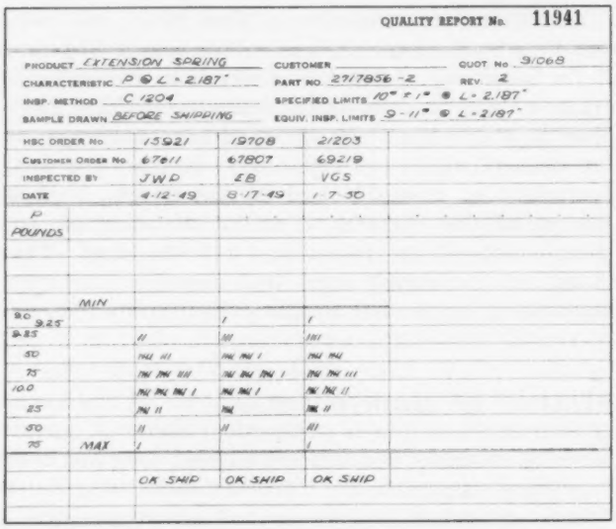
GROWING acceptance of statistical quality control methods as a means of increasing manufacturing efficiency and improving products is a trend you can't afford to overlook if you want to maintain or better your competitive position. This applies to small as well as to large plants.

Practically without exception, those manufacturers, big and little, who have adopted modern quality control practices suitable to their particular operations, are realizing several significant benefits. Scrap and rework, salvage and junk sink below 1 per cent and stay there. At the same time, production inches up toward a 10 per cent improvement.

Quality control in the shop adds steam to the sales effort. Good quality lessens the burden and expense of the service department and saves much of that hard-to-assess loss from disgruntled customers.

Pressure Is Increasing—The thumb is on many organizations to put in quality control. What might be called vendor plants, the majority of whom are typically job shops, feel the pressure most perhaps because their manufacturer customers use systematic (and statistical) quality control. The customers find their own quality results often diluted by absence of quality control in their vendor plants.

For Armed Forces materiel acceptance the quality control background is just about a must. Some larger

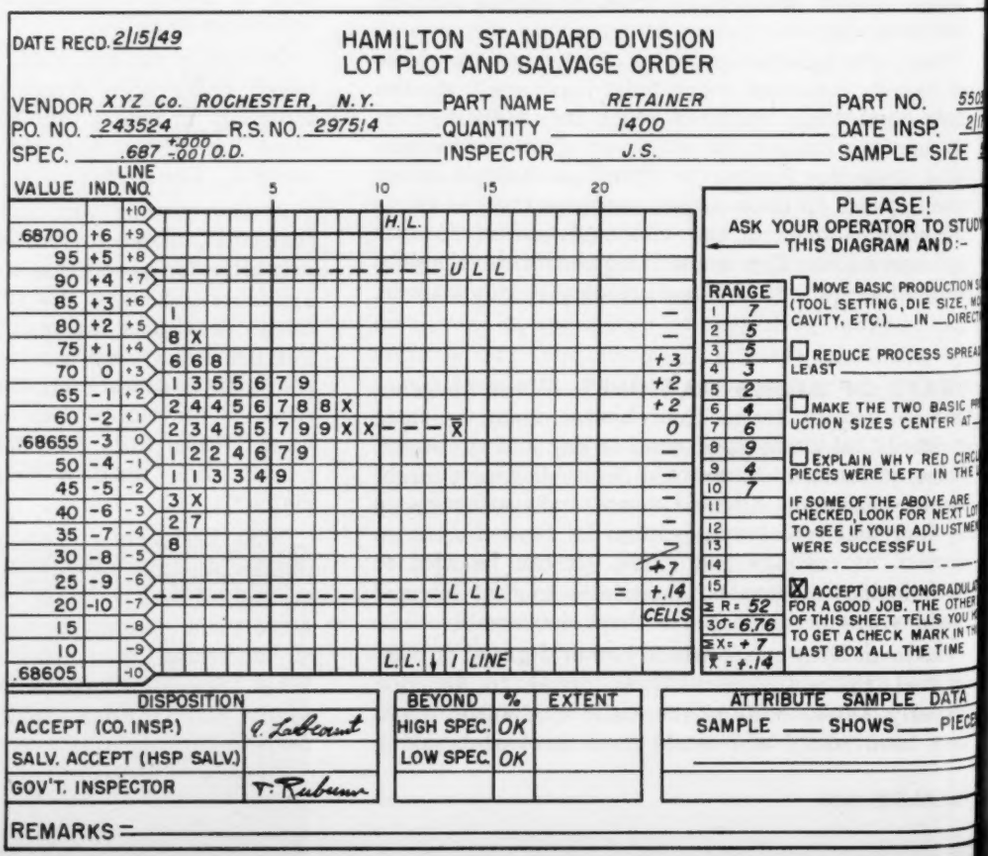


QUALITY REPORT No. 11941

PRODUCT EXTENSION SPRING — CUSTOMER — QUOT. No. 9/068
CHARACTERISTIC P @ L = 2.187" — PART NO. 27/7856-2 — REV. 2
INSP. METHOD C 1204 — SPECIFIED LIMITS 10" ± 1% @ L = 2.187"
SAMPLE DRAWN BEFORE SHIPPING — EQUIV. INSP. LIMITS 9-11" @ L = 2.187"

H&C ORDER No.		15921	19708	21203
CUSTOMER ORDER No.		67611	67807	69219
INSPECTED BY		JWD	EB	VGS
DATE		4-12-49	8-17-49	1-7-50
P POUNDS				
	MIN			
9.0				
9.25				
9.85		II	III	III
50		THL III	THL THL I	THL THL
75		THL THL III	THL THL THL I	THL THL III
10.0		THL THL THL I	THL THL I	THL THL II
25		THL II	THL	THL II
50		II	II	III
75	MAX	I		I
		OK SHIP	OK SHIP	OK SHIP

Fig. 1 (above)—Typical quality report kept by Hunter Spring Co. on each order of springs. Photostats of these reports accompany each shipment of goods



DATE RECD. 2/15/49

HAMILTON STANDARD DIVISION
LOT PLOT AND SALVAGE ORDER

VENDOR XYZ Co. ROCHESTER, N.Y. — PART NAME RETAINER — PART NO. 550
P.O. NO. 243524 — R.S. NO. 29714 — QUANTITY 1400 — DATE INSP. 2/1
SPEC. .687 +.000 -.001 O.D. — INSPECTOR J.S. — SAMPLE SIZE 2

VALUE	IND.	LINE NO.	5	10	15	20
		+10		H. L.		
.68700	+6	+9				
95	+5	+8			U L L	
90	+4	+7				
85	+3	+6	1			—
80	+2	+5	8 X			—
75	+1	+4	6 6 8			+3
70	0	+3	1 3 5 5 6 7 9			+2
65	-1	+2	2 4 4 5 6 7 8 8 X			+2
60	-2	+1	2 3 4 5 5 7 9 9 X X — — — X̄			0
.68655	-3	0	1 2 2 4 6 7 9			—
50	-4	-1	1 1 3 3 4 9			—
45	-5	-2	3 X			—
40	-6	-3	2 7			—
35	-7	-4	8			—
30	-8	-5				+7
25	-9	-6			L L L	= +.14
20	-10	-7				CELLS
15		-8				
10		-9		L. L.	I LINE	
.68605		-10				

PLEASE!
ASK YOUR OPERATOR TO STUDY THIS DIAGRAM AND:—

RANGE	
1	7
2	5
3	5
4	3
5	2
6	4
7	6
8	9
9	4
10	7
11	
12	
13	
14	
15	
Σ R = 52	
30 = 6.76	
Σ X = +7	
X̄ = +.14	

☐ MOVE BASIC PRODUCTION S... (TOOL SETTING, DIE SIZE, M... CAVITY, ETC.) ___ IN ___ DIREC...
☐ REDUCE PROCESS SPREAD ... LEAST ___
☐ MAKE THE TWO BASIC PR... UCTION SIZES CENTER AT ___
☐ EXPLAIN WHY RED CIRCL... PIECES WERE LEFT IN THE ...
IF SOME OF THE ABOVE ARE ... CHECKED, LOOK FOR NEXT LO... TO SEE IF YOUR ADJUSTME... WERE SUCCESSFUL
☒ ACCEPT OUR CONGRADUL... FOR A GOOD JOB. THE OTHER ... OF THIS SHEET TELLS YOU H... TO GET A CHECK MARK IN TH... LAST BOX ALL THE TIME

DISPOSITION	
ACCEPT (CO. INSP.)	G. Lafrance
SALV. ACCEPT (HSP SALV.)	
GOV'T. INSPECTOR	T. Reubens

BEYOND	%	EXTENT
HIGH SPEC.	OK	
LOW SPEC.	OK	

ATTRIBUTE SAMPLE DATA
SAMPLE ___ SHOWS ___ PIECE...

REMARKS =

Fig. 2 (right)—"Lot plot" condition of purchased system of recording parts. This chart shows that the 1400 parts received were comfortably within the 0.686-0.687-inch limits

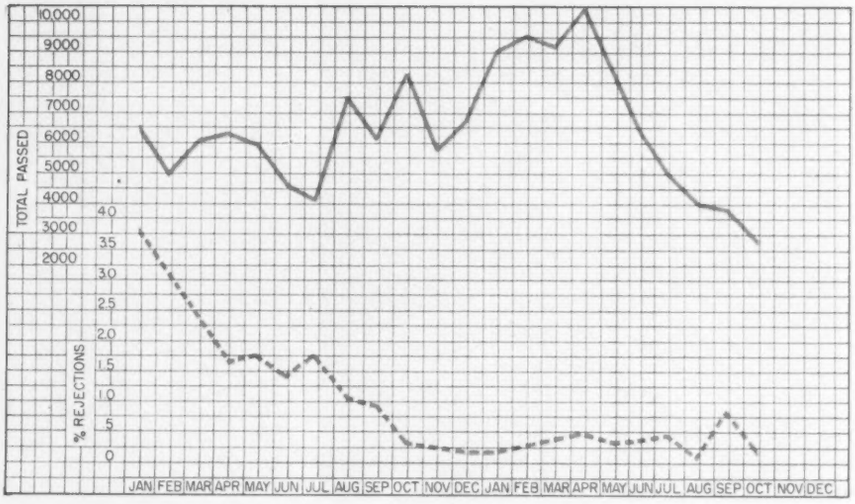


Fig. 3—Chart maintained by Wagner Electric Co. Upper curve records monthly production of one class of motor. Lower curve shows percentage of motors rejected at final test. Notice that production swelled from 6500 motors per month to 10,500 as quality control methods in the shop shrank rejections from 4 per cent to one quarter of 1 per cent

retail establishments are beginning to toy with the same idea. Standard sampling plans are spreading; quality level terms are appearing on purchase orders and, in a few instances, something in the nature of a quality control chart, graph or lot plot accompanies each shipment as a record of the goods' quality.

Fig. 1 is a typical quality report kept by Hunter Spring Co., Lansdale, Pa., on each order of springs. Photostats of these reports accompany each shipment.

In detail, the particular customer whose purchases are illustrated in Fig. 1 asked for a spring to exert 10 pounds pressure at a 2 3/16-inch compressed length. At the time of shipment random samples of the springs are tested and tallied with the sort of results illustrated. The samples and plots offer both supplier and customer 99 per cent assurance the springs are meeting requirements.

"Lot Plot" System Tallies Purchases—For the vendor who does not supply a quality record, inspectors at Hamilton Standard Propeller Division of United Aircraft, East Hartford, Conn., tally their own purchases. They have developed the "lot plot" system, of recording the condition of purchased parts, Fig. 2.

Ignoring the statistical technicalities, Fig. 2 shows that the 1400 parts received from a vendor were comfortably within the 0.686-0.687-inch limits. What the lot plot of Fig. 2 does not tell the uninitiated is that the statistical analysis, completed in a few minutes by a single inspector, offers a 99 per cent accurate picture as compared to the average 85 per cent efficiency Hamilton experienced when a group of inspectors spent several hours gaging and sorting such goods 100 per cent. Several dozen progressive plants have adopted the Hamilton system at receiving inspection.

Wagner Electric Co., St. Louis, maintains charts like the example in Fig. 3. Upper curve in this chart records monthly production of one class of motor. Lower curve shows percentage of motors rejected at final test. Notice that production swelled from 6500 motors per month to 10,500 (with materially little increase in production payroll) as quality control methods back in the shop shrank rejections from 4 per cent down to ¼ of 1 per cent.

Sampling Table Shows A.Q.L.'s—One simple routine for checking quality level, operation by operation and department by department, was originated many years ago by Western Electric engineers in the use of a sampling system illustrated by the sampling table, Fig. 4. This is one of a wide variety of sampling plans available, but a very reliable one. Note how size of sample to be taken varies with size of lot

SIZE	0-74	75-199	200-499	500-799	800-1299	1300-3199	3200-7999	8000-19999	20000-109999
PLE ZE	60	65	70	75	115	150	225	300	450
L.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.
%	0	0	0	0	0	0	0	1	2
%	0	0	0	0	0	1	2	3	4
%	0	0	0	1	2	3	4	5	6
%	0	0	1	2	3	4	5	7	9
%	0	0	2	3	4	5	8	10	14
%	0	1	3	4	6	8	11	14	20
%	1	2	4	5	8	10	14	18	26
%	2	3	5	6	9	12	17	22	28

Fig. 4—Sampling table is one simple method for checking quality level, operation by operation and department by department. Note how size of sample to be taken varies with size of lot or batch to be checked. Quality level (percentage of defective parts) in work being checked can be determined by the number of defective pieces uncovered in a sample

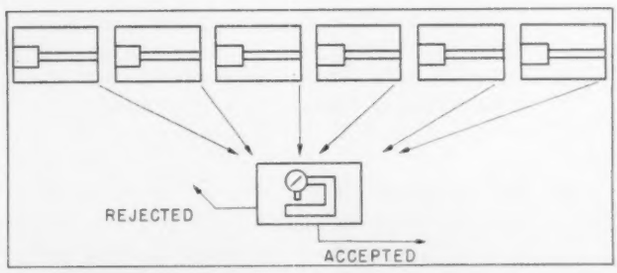


Fig. 5—Diagram showing how sampling table should be set up in the manufacturing area

Lift Output Through Quality Control

Small as well as large companies find these methods minimize rejects, improve manufacturing efficiency, spark sales effort, reduce service costs and build good will among customers

By C. W. KENNEDY
Quality Control Engineer
Federal Products Corp.
Providence, R. I.

GROWING acceptance of statistical quality control methods as a means of increasing manufacturing efficiency and improving products is a trend you can't afford to overlook if you want to maintain or better your competitive position. This applies to small as well as to large plants.

Practically without exception, those manufacturers, big and little, who have adopted modern quality control practices suitable to their particular operations, are realizing several significant benefits. Scrap and rework, salvage and junk sink below 1 per cent and stay there. At the same time, production inches up toward a 10 per cent improvement.

Quality control in the shop adds steam to the sales effort. Good quality lessens the burden and expense of the service department and saves much of that hard-to-assess loss from disgruntled customers.

Pressure Is Increasing—The thumb is on many organizations to put in quality control. What might be called vendor plants, the majority of whom are typically job shops, feel the pressure most perhaps because their manufacturer customers use systematic (and statistical) quality control. The customers find their own quality results often diluted by absence of quality control in their vendor plants.

For Armed Forces materiel acceptance the quality control background is just about a must. Some larger

QUALITY REPORT No. 11941

PRODUCT EXTENSION SPRING — CUSTOMER — QUOT. No. 91068
CHARACTERISTIC P @ L = 2.187" — PART NO. 27/7856-2 — REV. 2
INSP. METHOD C 1204 — SPECIFIED LIMITS .10" ± .1" @ L = 2.187"
SAMPLE DRAWN BEFORE SHIPPING — EQUIV. INSP. LIMITS .9 - 11" @ L = 2.187"

HSC ORDER No.		15921	19708	21203
Customer Order No.		67611	67807	69219
INSPECTED BY		JWD	EB	VGS
DATE		4-12-49	8-17-49	1-7-50
P POUNDS				
	MIN			
8.0	9.25		/	/
9.25		//	///	////
50		THL ///	THL THL /	THL THL
75		THL THL ///	THL THL THL /	THL THL ///
10.0		THL THL THL /	THL THL /	THL THL //
25		THL //	THL	THL //
50		//	//	///
75	MAX	/		/
		OK SHIP	OK SHIP	OK SHIP

Fig. 1 (above)—Typical quality report kept by Hunter Spring Co. on each order of springs. Photostats of these reports accompany each shipment of goods

DATE RECD. 2/15/49

HAMILTON STANDARD DIVISION
LOT PLOT AND SALVAGE ORDER

VENDOR XYZ Co. ROCHESTER, N.Y. — PART NAME RETAINER — PART NO. 55037
P.O. NO. 243524 — R.S. NO. 29714 — QUANTITY 1400 — DATE INSP. 2/17/49
SPEC. .687 +.000 -.001 O.D. — INSPECTOR J.S. — SAMPLE SIZE 50

VALUE	IND. NO.	LINE NO.	5	10	15	20	
		+10		H.L.			
.68700	+6	+9					
95	+5	+8				U L L	
90	+4	+7					
85	+3	+6	1				—
80	+2	+5	8 X				—
75	+1	+4	6 6 8				+3
70	0	+3	1 3 5 5 6 7 9				+2
65	-1	+2	2 4 4 5 6 7 8 8 X				+2
60	-2	+1	2 3 4 5 5 7 9 9 X X — — — $\bar{X}$				0
.68655	-3	0	1 2 2 4 6 7 9				—
50	-4	-1	1 1 3 3 4 9				—
45	-5	-2	3 X				—
40	-6	-3	2 7				—
35	-7	-4	8				—
30	-8	-5					+7
25	-9	-6				L L L	= +.14
20	-10	-7					CELLS
15		-8					
10		-9					
.68605		-10		L.L. ↑ 1 LINE			

PLEASE!
ASK YOUR OPERATOR TO STUDY THIS DIAGRAM AND:—

RANGE	
1	7
2	5
3	5
4	3
5	2
6	4
7	6
8	9
9	4
10	7
11	
12	
13	
14	
15	
$\geq R =$	52
$3\sigma =$	6.76
$\geq X =$	+7
$\bar{X} =$	+.14

☐ MOVE BASIC PRODUCTION SIZE (TOOL SETTING, DIE SIZE, MOLD CAVITY, ETC.) ___ IN ___ DIRECTION
☐ REDUCE PROCESS SPREAD AT LEAST ___
☐ MAKE THE TWO BASIC PRODUCTION SIZES CENTER AT ___
☐ EXPLAIN WHY RED CIRCLED PIECES WERE LEFT IN THE LOT
IF SOME OF THE ABOVE ARE CHECKED, LOOK FOR NEXT LOT PLOT TO SEE IF YOUR ADJUSTMENTS WERE SUCCESSFUL
☒ ACCEPT OUR CONGRADULATIONS FOR A GOOD JOB. THE OTHER SIDE OF THIS SHEET TELLS YOU HOW TO GET A CHECK MARK IN THIS LAST BOX ALL THE TIME

DISPOSITION	
ACCEPT (CO. INSP.)	P. Lafrance
SALV. ACCEPT (HSP SALV.)	
GOV'T. INSPECTOR	T. Ruberus

BEYOND	%	EXTENT
HIGH SPEC.	OK	
LOW SPEC.	OK	

ATTRIBUTE SAMPLE DATA
SAMPLE ___ SHOWS ___ PIECES

REMARKS =

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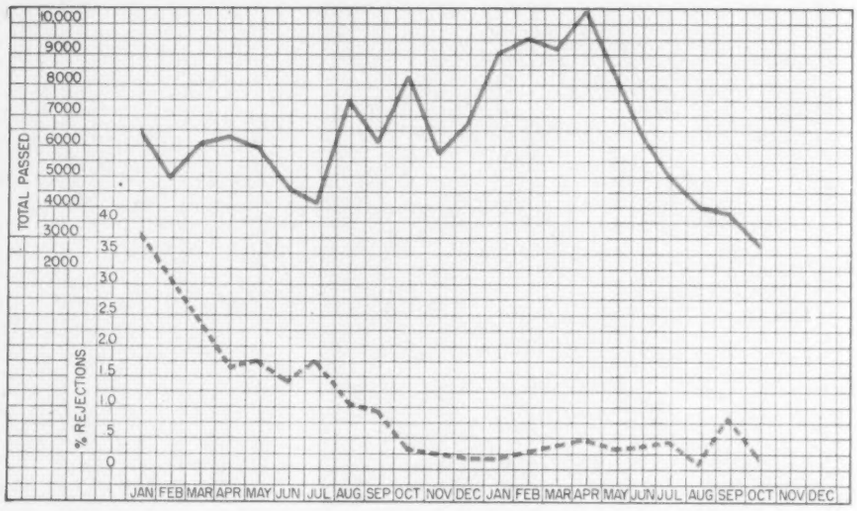

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LOT SIZE →	0-74	75-199	200-499	500-799	800-1299	1300-3199	3200-7999	8000-19999	20000-109999
SAMPLE SIZE →	60	65	70	75	115	150	225	300	450
A.Q.L. ↓	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.	ACC. NO.
.10%	0	0	0	0	0	0	0	1	2
.25%	0	0	0	0	0	1	2	3	4
.50%	0	0	0	1	2	3	4	5	6
1.0%	0	0	1	2	3	4	5	7	9
2.0%	0	0	2	3	4	5	8	10	14
3.0%	0	1	3	4	6	8	11	14	20
4.0%	1	2	4	5	8	10	14	18	26
5.0%	2	3	5	6	9	12	17	22	28

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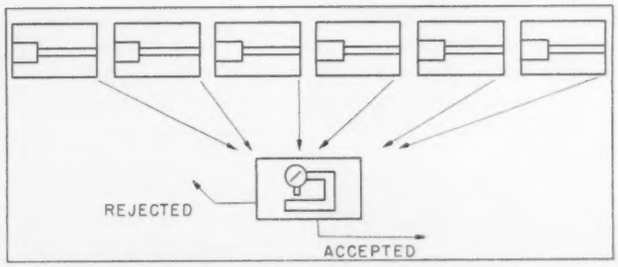

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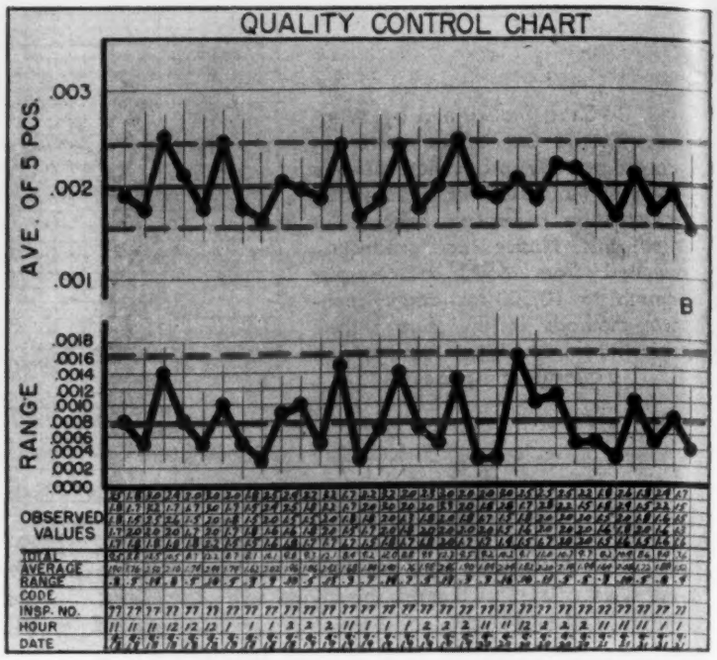


Fig. 6 (A)—Inspector checking paint thickness on International Harvester truck. (B) Inspector's findings are charted in 0.0001-inch aiding paint mixers, sprayers and supervision

or batch to be checked, and that the quality level (percentage of defective parts) in the work being checked can be determined by the number of defective pieces uncovered in a sample.

Western Electric engineers worked on the thesis that it is uneconomic if not virtually impossible to manufacture any component, part, material or product day in and out without a percentage of the output being substandard or defective. This explains why the sampling table shows A.Q.L.'s (for acceptable quality level) varying from 0.10 per cent to 5 per cent.

It Can't Be Perfect—By and large, countrywide, the following conclusions were reached by those adopting the modern quality control philosophy.

(a) It is just about impossible in daily manufacfacture to make anything but what one tenth of 1 per cent of it will be rejectable in some fashion.

(b) An A.Q.L. of ½ of 1 per cent seems to be generally commercially acceptable for repair parts shipped out. Of the many products sold, at least five in a thousand units are substandard or defective to some degree. Yet sales continue without undue unfavorable consumer reaction. (One automobile manufacturer's statistics of a year ago revealed that sixteen of every hundred new cars reaching dealers were imperfect in some fashion—16 per cent!)

(c) In the manufacture of components, parts and subassemblies going to final product assembly a sensible A.Q.L. seems to be 2 per cent.

(d) Manufacturers buying parts and materials find A.Q.L.'s varying from 2 per cent to 5 per cent satisfactory on most of their purchases.

The basic Western Electric batch sampling idea was adopted at the author's plant. The plan was modified to accommodate so-called job lot conditions and further developed to replace roving inspections and 100 per cent sortings.

Where Do You Start?—One routine covers the area in a machining department where parts, in tote boxes or on pallets — having been degreased, cleaned, weighed or counted—are picked up by truckers to be taken to stock rooms, to succeeding or secondary operations, or directly to assembly benches. A useful control system is set up under which an inspector samples the succession of lots at, say, a 2 per cent quality level. Those batches that fail to "pay toll," that contain more than the prescribed 2 per cent defectives, as indicated by the sampling, are not allowed to pass on but are rejected back to the manufacturing department where they are salvaged, detailed (100 per cent sorted), subjected to deviation committee action or bodily scrapped.

True, the system just described is after-the-fact reporting, but an inspection road block which lets only qualified, legitimate goods by has the same remarkable effect on quality improvement in the responsible manufacturing department as state police examinations have on the jallopies who turn around ruefully and see about getting their brakes repaired. Provided—and this is important—higher shop authority does not yield to the double standard expediency of condoning substandard work on the excuse of "bottleneck", or some similar pretext, and continually override the inspector and the sampling plan—"fix" the erring manufacturing department's traffic ticket, as it were.

Sampling Table Is "Toll Gate"—Naturally, the nearer to the source an inspection can be made, and the sooner the quality of output can be analyzed, the lower become the potential losses from substandard manufacture. In this direction, the sampling table plan is set up in the manufacturing area, close to

MESTA Forgings

Mesta has facilities for the production—from raw material to finished product—of forgings in all sizes required by industry. Shown is a gigantic generator shaft, forged in a 6000-ton Mesta Press, and finished in the Mesta Shops.

Write for descriptive forging literature.

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE CO.

PITTSBURGH, PA.

it or in the natural line of flow of production, Fig. 5.

Arrangements are made to send the work from each machine to the inspection station as frequently as possible—once every half hour, or once an hour. Here work is sampled. If it meets specifications it is sent on. If it fails, it is returned to the machine.

"How'm I Doing?"—Several psychological, as well as practical, advantages are gained by the layout described. They usually outweigh the seemingly imponderable mechanics, the nuisance of getting the work routed to the inspection station and the flow interrupted there long enough for the sampling procedure. In the first place, the system supplies what the operator craves—an impartial and timely answer to the question, "How'm I doing?" Secondly, it highlights incompetent machines, tooling, methods or processes, especially where frequent rejections occur. Third, it puts the finger on careless operators.

More often than for any other reason perhaps, the trouble lies in the machine long in need of an overhaul. Or the tooling is inferior, the method poor, the time standard wrong. The sampling routine sets operator and tool-setter howling, rightfully, where heretofore they had no special need for making their justified gripes vocal. The usual initial traffic jam occurring at the toll gate reflects the deficiencies in local, departmental supervision.

Chart Systems Added—The next step in most factories is the addition of chart systems and statistical techniques to patrol inspections.

Reviews of scrap and salvage situations ordinarily found leave considerable doubt as to the efficiency of traditional roving and floor inspection. Either the inspector is unsystematic and overburdened or he is dilatory and careless. Occasionally he may be "in cahoots" with operators on piece rate, or production men have no respect for his opinions. If he is given the authority to shut down machines, operators pass the buck of quality completely to him—"So what, the inspector didn't catch it".

But if he must keep a chart of his inspection results, the climate changes. In the first place he cannot maintain a satisfactory chart without being systematic and on time; and his sampling must be authentic. In the second place, publicizing the record of quality, as the chart does, puts an operator on his mettle. Third, the chart display rouses supervision, tool setters, machine maintenance, process engineers and the like either to perform as they should or to excel in their particular functions.

Chart Record Takes Effect—The effect of quality control is well verified in the results displayed by a percentage chart kept of the output of a bearing diameter operation in one of the Ford plants. It shows how operators on both shifts had habitually produced between 2 per cent and 9 per cent out-of-tolerance pieces. As the chart record took effect and improvements were made in tooling methods and time standards, operation losses sloped to less than 2 per cent.

As at Ford, the truck division of International Harvester in Fort Wayne, Ind., maintains many hundred quality control charts covering source and patrol inspections. Fig. 6 speaks for itself. One statement missing from the photo's caption is how scientific management, analysis and quality control assures the truck buyer of a vehicle longer lasting in appearance and wear.

"Newsreels" of Operations—Fig. 7, shows statistical quality control "in the flesh". Here the patrol inspector at the Federal Products plant in Providence, has gaged and checked the half-hourly sample from the machine and is plotting the quality graph of the operator's skill on a chart. Charts, which are newsreels of each operation, are kept posted at each machine. Use of statistical quality control methods here on a fairly difficult machining job helps to hold scrap and rework below 1 per cent, where at one time it averaged 14 per cent with a peak of 27 per cent.

Quality control is not confined to the industrial midriff of the country. It is booming along with industry, for example, on the West Coast. Clary Multiplier Corp., San Gabriel, Calif. uses the system to record not only satisfactory, "in control" screw machine operation but also to confirm ability of the

Fig. 7—Patrol inspector has gaged and checked the half-hourly sample from the machine and is plotting quality graph of the operator's skill on the chart

machine and tooling to hold close tolerances.

Traveling south to Chattanooga, Tenn., we found quality control hard at work in American Lava Co.'s factory, helping to maintain control over specialized operations on the sort of tricky ceramic parts appearing in Fig. 9. The demand on this company's manufacturing departments is to hold exceedingly close tolerances and relationships on intricate molded components.

Rejects Drops to 0.5%—In New England, where the color of the dollar is closely examined, systematic quality control was a natural. The procedure has been adopted, for example, in the huge Saco-Lowell Shops in Biddeford, Me., where about every variety of textile machinery, except looms, is manufactured. Saco-Lowell digs into basic operations with charts and sampling procedures.

Fig. 8 illustrates a display of control charts in their automatic department of 140-odd machines. Substandard and out-of-tolerance parts in that one department dropped from 20 per cent to a gratifying ½ of 1 per cent.

The workers themselves take readily to quality control. The sampling and charts praise the worker as well as criticize him. They compare him with others and with himself daily and hourly, with what he did quality-wise yesterday and last month. Operators appreciate the just, unbiased appraisals of their workmanship the reports offer. The worker feels instinctively he should gain recognition not only from the quantity of work he puts out but also the quality.

What Does the Program Cost?—Of all the things possible to be tried toward improving the operating statement, quality control seems to require the least investment, and, done right, no additional maintenance appropriations. A new machining or tooling proposition may demand, by contrast, a $30,000 equipment purchase; a thorough-going materials handling layout can run into the hundreds of thousands.

One initial quality control expense usually includes the necessary education of supervisory personnel. This may mean the expense of sending men to several of the available courses in quality control or the decision may be to hire in a consultant for a period. Such an outlay should surely be figurable in four figures.

Some plants have hired more or less qualified and experienced quality control engineers and added them to the payroll; others have allowed the time and expense for in-plant executives to secure the required technology. The author favors the latter procedure as seeming to be, by and large, the most successful attack.

As for any further payroll expense to establish a so-called quality control department, there are few plants without a sufficient abundance of inspection and clerical personnel which can be readily transferred to the new effort without perceptible loss to the areas from which they came.

Gages, scales, hardness testers, timers and other measuring apparatus a successful quality control venture usually demands, are equipment the factory probably should have long since had anyway. In addition, almost universally, their cost seldom exceeds 10 per cent of what is saved in scrap, salvage, and otherwise by the quality program the first year.

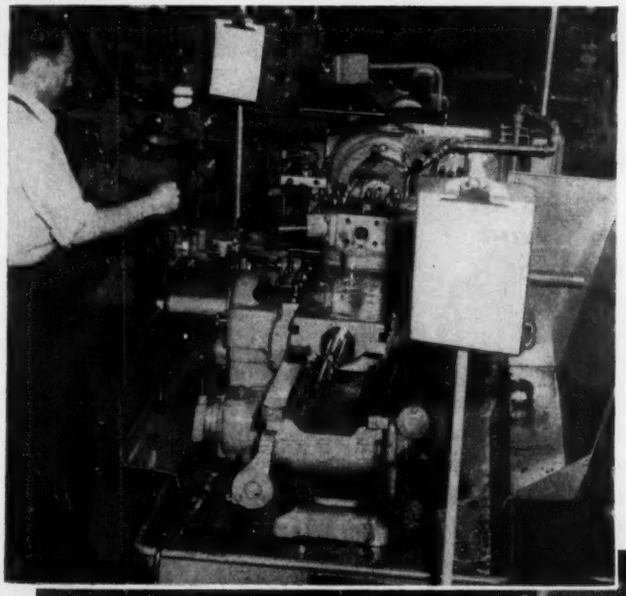
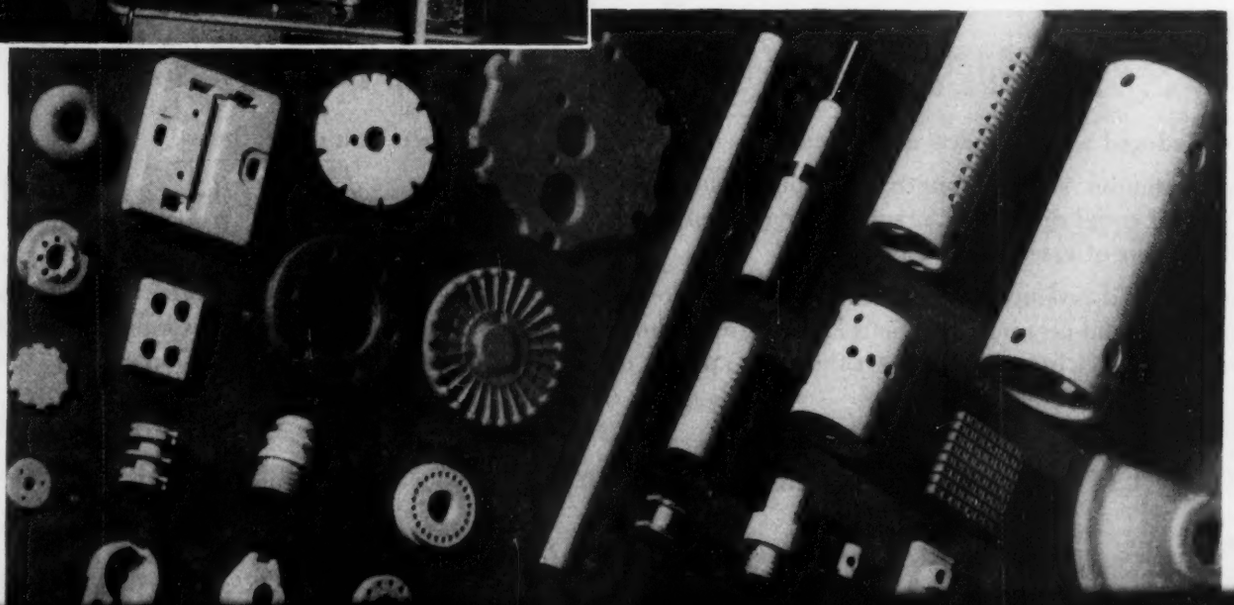


Fig. 8 (left)—Substandard and out-of-tolerance parts produced in an automatic department of about 140 machines were reduced from a level of 20 per cent to ½ of 1 per cent. Note control charts on machines

Fig. 9 (below)—Specialized operations required to make these ceramic parts are quality controlled



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Rollpins are a new-type, pressed-fit fastener. Chamfered ends permit fast, easy insertion of Rollpins with the use of either hand tools or automatic jig assemblies. Compressed as they are driven into place, Rollpins exert constant pressure against the hole walls—stay permanently in place until deliberately removed with a drift or pin punch.

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Rollpins are made from either Carbon Steel or Stainless Steel (also from Beryllium Copper on special order) . . . and are readily available from stock in sizes (diameters) from 5/64 to 1/2 inch and in standard lengths. For full information and test samples, fill in and mail the coupon at right today.

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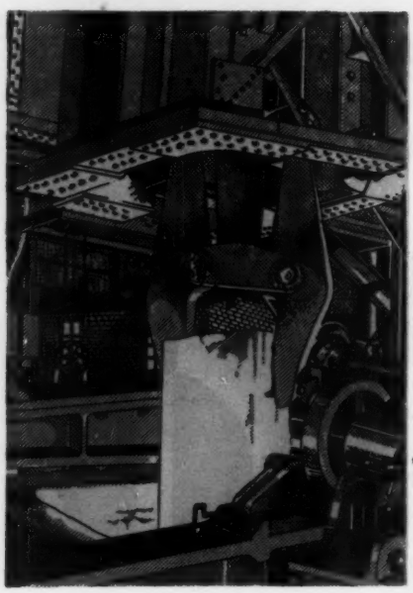


Steel Engineers Talk Over New Technical Developments

IMPROVEMENTS in conveying equipment, cold rolls, metal drawing lubricants, temper rolling, and important phases of blast furnace and steel plant operation were brought out in 46 technical papers presented at the Fall meeting of the Association of Iron and Steel Engineers, Cleveland Public Auditorium, Sept. 26-29.

Self-Centering Rolls Cut Costs

E. T. Lorig, chief, Senior Staff Engineering Bureau, Carnegie-Illinois Steel Corp.

Metal strip processing lines equipped throughout with self-centering rolls and with pivoted automatic self-centering pinch rolls properly located in the line have the ability to dampen out errors in strip alignment as the strip proceeds through the line, regardless of camber.

Initial cost of the rolls themselves, STEEL, p. 83, Sept. 25, 1950, may be somewhat higher but the advantages to be gained in securing reliable tracking of strip and belts of all kinds, with the elimination of side guides and auxiliary guiding mechanisms in many instances, should materially reduce the initial overall cost of the equipment.

Little Maintenance Needed — Maintenance of the split automatic self-centering rolls themselves, according to the author and inventor of the rolls, should be less than for conventional rolls for two reasons; first, automatic centering and tracking of strip-like material can be secured under far less strip tension than presently required; second, the crowning or conical effects on rolls can never be totally destroyed by wear on automatic self-centering rolls while in operation. These factors indicate that less wear on rolls surfaces will be encountered, resulting in many more hours of service before the rolls must be removed for regrinding and repair.

He warned against the use of spring, counterweighted, hydraulic or air cylinder journal mountings free to function independently for all types of rolls and pulleys to be utilized for conveying metal strip under tension through high-speed processing lines. Rotating rolls with such mountings (when subjected to pressure by the strip being forwarded or utilized for creating pressure against the moving strip or object, such as a rotating coil of metal strip being unreeled into a continuous pickler) can cause the strip or coil to immediately leave the center pass line with a rapidity that is astounding.

Carbide Rolls Give Better Finish

R. T. Beeghly, vice president and general manager, Metal Carbide Corp., Youngstown.

Two types of basic roll design are used in advancing carbide rolls for cold rolling metals—these being either of solid or sleeve-type construction. For cold rolling strip lighter than ½-inch, rolls having a solid carbide body and solid carbide necks are usually recommended, particularly when used on 4-high or cluster-type mills where rolling pressures are greater.

Solid carbide rolls are being used for cold rolling all common types, grades and analyses of strip steel. It has been general practice to operate carbide rolls at the same rolling speeds as used for steel rolls, although carbide rolls can be operated up to double conventional speeds without affecting roll life. Rolling speeds average 1200 to 1500 feet per minute with certain applications exceeding 2000 feet per minute.

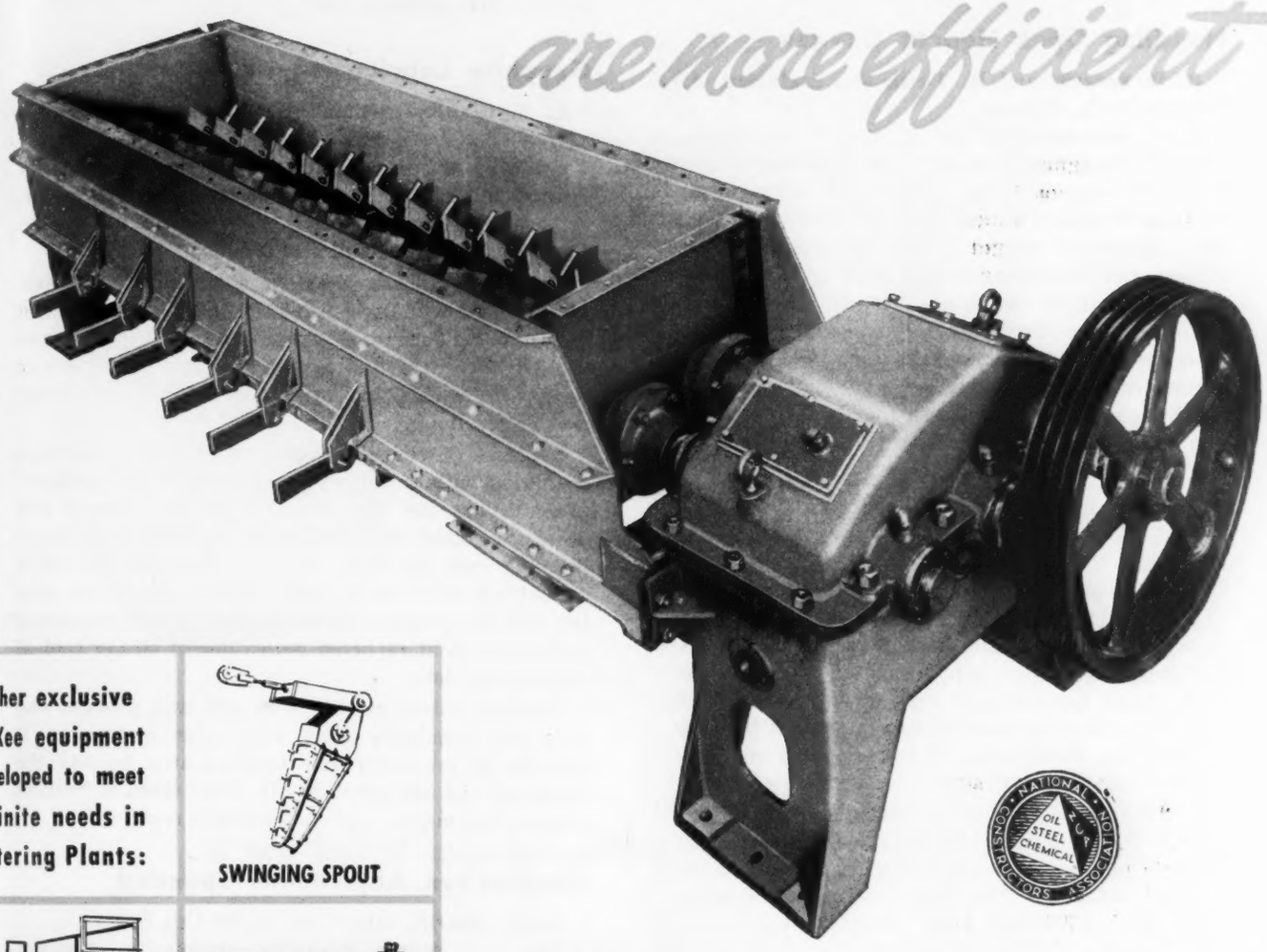
Better Work, Less Waste—Common finishes used on carbide rolls are 180, 400 and 600 grit polished to a high luster. On strip where slippage occurs, a 180-grit finish is recommended. Bright finish strip is being regularly produced with carbide rolls having a surface variation of less than 3 millionths of an inch (0.000003-inch) or approximately twice the flatness and smoothness of strip rolled with steel rolls. Gage and tolerance are held within close limits, which adds more useable lengths per coil and reduces waste. The bright finish produced by carbide rolls eliminates need for further buffing or polishing and is retained during the annealing operation.

Operation of carbide-sleeve rolls follows closely the practice used with steel rolls as to rolling speeds, amount of reduction, lubricant, and annealing cycle. Speeds average from 100 to 500 feet per minute with several installations operating at 1500 feet per minute. Amount of reduction per pass ranges between 20 and 40 per cent depending on hardness and

Here's one of the reasons

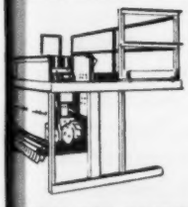
McKEE SINTERING PLANTS

are more efficient

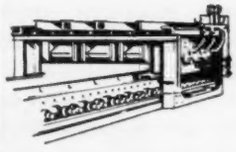


Other exclusive McKee equipment developed to meet definite needs in Sintering Plants:

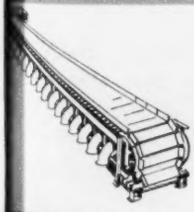
SWINGING SPOUT



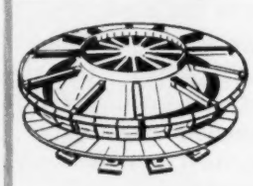
EATING FEED HOPPER



IGNITION FURNACE



INTERING MACHINE



ROTARY AIR COOLER

OUR long experience in engineering and constructing complete sintering plants has shown us that good sinter depends to a great extent on thorough mixing of raw materials.

We are primarily engineers and contractors — not equipment manufacturers, but we designed this pug mill to fulfill our policy of designing specialized equipment if satisfactory equipment is not otherwise available.

The improved paddle design of this two-shaft, heavy-duty pug mill not only does a more thorough job of mixing but, also, has resulted in a mixing device of greater efficiency and dependability. Rugged design and construction throughout assure trouble-free continuous service. Drive gears are entirely enclosed in an oil bath for longer wear. Easily removable shafts simplify maintenance or replacement of paddles.

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DESIGN, ENGINEERING AND CONSTRUCTION FOR THE IRON AND STEEL AND PETROLEUM REFINING INDUSTRIES

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analysis of flat wire rolled. In addition to rolling all common grades and analyses of steel flat wire, carbide rolls have also given good performance on special grades of wire.

Handling Open Hearth Oxygen

B. P. Sarasin and **R. Tietig Jr.**, engineers, A. J. Boynton & Co., Chicago.

Local considerations are of utmost importance in correctly designing a storage and distribution system to supply oxygen to an open-hearth plant. Certain features of design which apply generally to any plant are: Sizing of oxygen generating unit, storage facilities, and the piping should have as a background actual operating conditions. These should indicate the average requirements for oxygen and the maximum and minimum demand rates.

Rate of oxygen production will be relatively constant regardless of the type of generating unit. The gas holder finds its application where the demand for oxygen is relatively constant. The spherical pressure vessel can be used to advantage when the demand is variable and storage pressure does not exceed 150 pounds per square inch gage. Where the demand is variable, and the storage pressure exceeds this pressure, then the cylindrical pressure vessels should be used. Unless the average demand exceeds approximately 300,000 cubic feet an hour the oxygen compressor should be of the reciprocating type. If the demand exceeds that figure then under certain conditions centrifugal units may be considered.

Watch Oxygen Handling—Piping should meet the plant standards for compressed air lines with the additional feature that combustible thread lubricants, gasket materials and packing must not be used.

Instrumentation and control should be in sufficient quantity that manual operation is kept to a minimum and that accounting for oxygen usage is provided. Warning signals for irregularities in operation also should be installed. Oxygen must not be allowed to come in contact with any readily combustible material during compression and distribution.

It is the combination of these features and with full consideration of local conditions that form the basis for a correctly designed oxygen storage and distribution system. A system designed on such a basis will result in an adequate supply of oxygen to furnaces with a minimum expenditure for facilities and at a low operating cost.

Kelly Awards

First prize of the Kelly award papers was given G. S. Mican, division superintendent, rolling, Carnegie-Illinois Steel Corp., South Works, Chicago, for his contribution "Deformation in Rolling." Second prize went to A. J. Fisher, assistant chief engineer of construction, Bethlehem Steel Co., Bethlehem, Pa. for his paper on "Fuel Oil in the Steel Industry."

Third prize was shared jointly by K. N. Bundy and P. E. Jordan, Wheeling Steel Corp. for their paper on "Water Pollution Control in the Steel Industry." The Kelly award carries prizes of $300, $200 and $100, respectively.

Graphite Lubricating Pays Off

E. S. Glauch, mechanical engineer, Joseph Dixon Crucible Co., Jersey City, N. J.

Graphite due to its ability to fill in low spots on journal and bearing, enables operators to keep equipment in operation which otherwise would have to be shut down for over-haul.

Graphite lubricates bearings operating at temperatures which will carbonize oil and greases. Tunnel kilns, annealing furnaces and continuous core ovens are being lubricated with this product. A vehicle or carrier is used which will vaporize without leaving carbon residue.

No Dust Catcher—Graphite supplied in paste form is diluted with a thinner and applied to the surface; after drying the film provides dry lubrication and does not collect and hold dust and dirt. The paste is being used on center castings, diaphragms, buffer assemblies, etc., and on diesel locomotives where sliding friction occurs. Railroads use it for lubricating switch plates at reported reductions of 50 per cent in lubricating costs.

Graphite mixes readily with oils and greases and does not chemically react with other materials. It withstands pressures and temperatures beyond the range of oils and greases. In most cases it reduces power consumption and maintenance costs.

Combustion Adjustment Speeded

Joe G. Sparks, Cities Service Oil Co., Chicago.

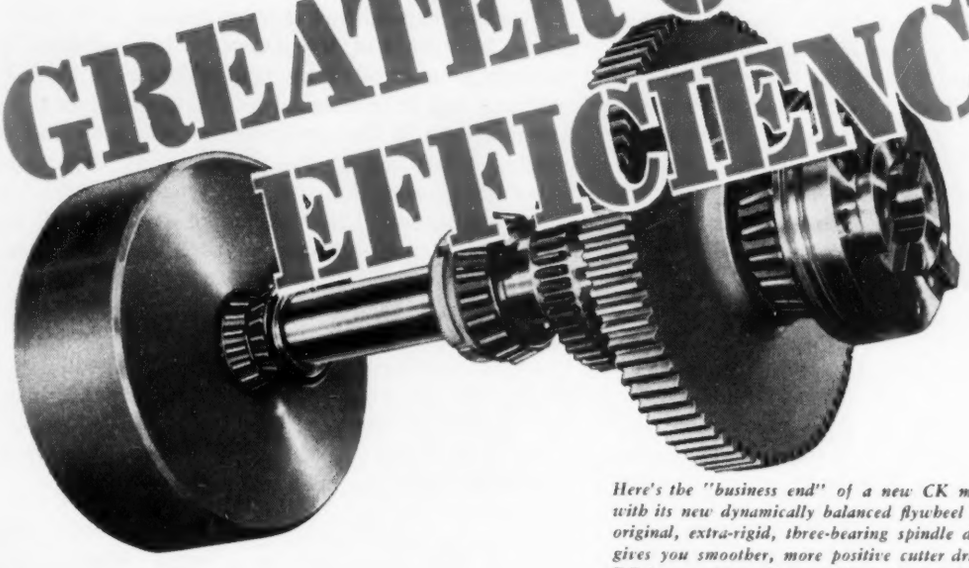
The heat prover measures combustion efficiency of any type of furnace using any form of fuel. It measures both the percentages of oxygen and the unburned hydrocarbons in the fuel gases. These products of combustion are measured both accurately and continuously, and the readings are both instantaneous and continuous. With this information you have the percentages of oxygen, combustibles, excess air and CO_2 present in the gases.

The instrument is portable, complete within itself, weighing about 25 pounds. One side is designed to measure combustibles, or unburned fuel, which is the product of incomplete combustion. The other section of the instrument is used to measure the oxygen content of the sample.

Tests in Two Minutes—The constant speed motor-driven pump, hydrogen generator and analyzers form an integral part of the instrument, and all operations are automatic. Absolute accuracy is insured through the use of a unique system of checking instruments. In a test that takes about two minutes, laboratory analyzed gas of a known composition is fed into the instrument and corrective calibrations made if necessary.

This as well as all other instruments are used to give better product quality control, decrease down

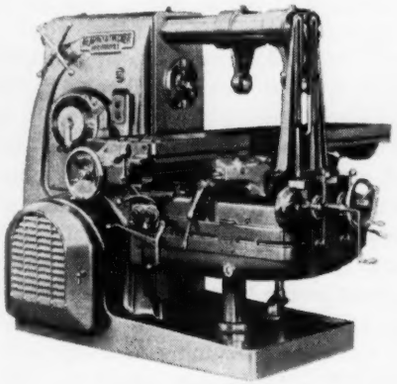
GREATER CUTTING EFFICIENCY



Here's the "business end" of a new CK milling machine — the spindle — with its new dynamically balanced flywheel and Kearney & Trecker's famous, original, extra-rigid, three-bearing spindle design. Added flywheel momentum gives you smoother, more positive cutter drive — the key to Greater Cutting Efficiency using modern cutting tools. And you get increased cutter life, too. The three-bearing spindle design affords ample support and greater rigidity. The heavy duty wide-faced spindle drive gears of forged steel are specially processed for longer life and exceptionally smooth, quiet operation.

A new line of knee-type milling machines

KEARNEY & TRECKER MILWAUKEE **CK's**



New Model CK
25 hp No. 5 Plain Style
Milling Machine

YES, Kearney & Trecker's new CK milling machines are packed with design and operating features that make them *more productive, more profitable for you.*

Spindle-mounted flywheel, broad feed and speed ranges and greater horsepower with separate motor drives for spindle, and feed and rapid traverse, mean you get fullest possible benefit from modern cutting tools.

New CK columns give you greater rigidity. Compared to former columns, they give you 1000 pounds more metal in heavier ribbing, in box-type, sponson construction to absorb vibration from heaviest cutting loads.

For greater production, these machines are equipped with Kearney & Trecker's famous Mono-Level Control that shortens floor-to-floor time, and materially reduces operator fatigue. New, non-glare micrometer dials help avoid costly errors in reading . . . give you a positive lock at every setting.

Automatic flood lubrication in column and knee and positive metered lubrication to table and saddle, plus generously proportioned gears and shafts assure you greater machine life.

Find out for yourself about Kearney & Trecker's new CK line of knee type milling machines . . . how they meet every demand of modern milling practice . . . how they can give you greater production at greater profit.

Sizes are No. 2, 3, 4, 5, and 6 . . . Plain and Universal styles. For complete details, contact your nearest representative or write direct. Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wisconsin.

REPLACEMENT OF OBSOLETE MACHINE TOOLS IS AN INVESTMENT THAT MAKES BOTH DOLLARS AND SENSE

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

time, increase product volume yield and better effect economy of time, material and labor.

Back Drafting Practice

Owen R. Rice, metallurgical engineer, Freyn Engineering Co., Chicago.

The purpose of back drafting is the complete and safe disposal of residually generated gas on a shutdown blast furnace, which gas under its own pressure would otherwise issue dangerously from openings, or would percolate into the blast system to constitute an explosion hazard. Likewise, all stove valves should be shut when the wind is completely off the furnace except the hot blast valves, chimney valves, and burner door of the back-draft stove. The back-draft gas should be burned in the back-draft stove. Back drafting should be conducted whenever the wind is completely off the furnace.

Unburned Gases Dangerous—Back drafting can be made hazardous by conducting it improperly; principally by failure to burn the gas. Certain design and construction features can contribute to the hazard of back-drafting, that is, inadequate chimney height, snort valve discharging it to the chimney flue, etc. Back drafting properly conducted can be insurance in case of some human or mechanical failure. In a broad sense, back drafting is the means for permitting the wind to be taken completely off the blast furnace in a safe manner.

Engineers Can Guide Spending

T. D. Jolly, vice president, Aluminum Co. of America, Pittsburgh.

Average expenditure for materials and fuel requires 56.6 cents of the American sales dollar. The percentage controlled by the engineer is harder to evaluate, but it is considerable. He also has a large responsibility in the expenditures made by the purchasing department. Many purchasing departments today are headed by and largely staffed with engineers. Whatever their branch of training, all work toward one goal—proper materials in the proper place at the proper time at the proper price.

Controllers' Institute found that possibilities for reducing costs fall in four general categories: (1) Inventory reduction and subsequent control, (2) reduction of production costs, (3) cutting administrative overhead, and (4) expanding sales. If we are going to do a real job of cost reduction, we might well invite the controllers department to join in.

Simple Tool Makes Oddly-Contoured Patterns in 20 Minutes

RALPH C. Hickernell's wartime job of building oddly-contoured alcohol and water tanks to fit available spaces within submarines is responsible for the invention of a pattern tool for transition pieces that is rapidly becoming the most important product of his Meadville, Pa., contract metal shop.

With the tool, patterns for transition pieces can be produced in 15 to 20 minutes, regardless of the shape—square to round, rectangular to round, round to round, square to rectangular or otherwise.

Drawing board drudgery and slide rule mathematics are eliminated by the above simple tool which provides patterns for transition pieces in 15 to 20 minutes

Mr. Hickernell, a sheet metal worker and designer, got the idea from the "target" method of pattern making used at Cramp Shipbuilding Corp. during the war.

Designer's Nightmare—Because it is necessary to utilize all available space on a submarine, tanks are tucked away in strange and wonderous places. The necessary drawings and culculations involved in making these oddly-contoured tanks are a designer's nightmare and require days of concentrated work.

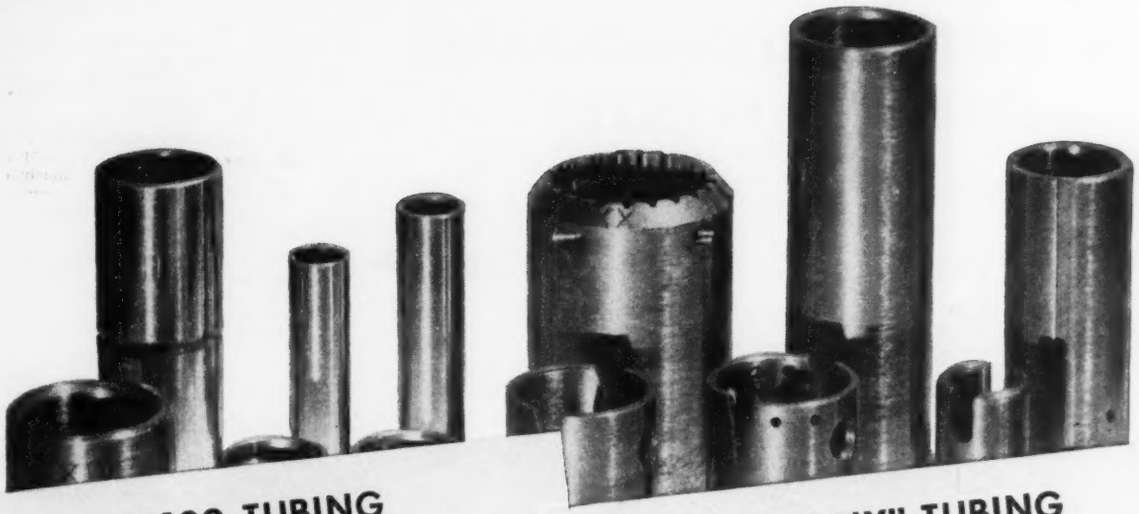
With the "target" method, a mock-up of the tank is built at the spot it is to occupy. Removed, the pattern for the tank could quickly and accurately be determined by "rolling" the target over the pattern paper, marking all outline points at which it touched.

Back in his own sheet metal shop after the war, Mr. Hickernell considered the possibility of eliminating drawing board drudgery and slide rule mathematics on transition pieces through some development of the target method. Obviously, a full-scale mock-up would be too time consuming and expensive.

The New Shortcut—Mr. Hickernell solved the problem with his pattern tool. It consists of two "heads" into which half-shapes of the top and bottom openings can be clamped. These heads are then positioned for perpendicular height and angular adjustment over a simple vertical section drawing of the desired piece. The angular adjustment takes care of desired taper.

With the half-shapes and heads properly positioned the tool is "rolled" over a sheet of pattern paper, and the paper marked where the heads touch it. This setup makes a pattern for half the transition piece.

In a rush? Two TIMKEN® steels will do 90% of your hollow-parts jobs!



52100 TUBING

101 STOCK SIZES

HIGH CARBON CHROME STEEL—A DIRECT-QUENCHING STEEL WHICH GIVES THROUGH HARDNESS IN MODERATE SECTIONS.

Typical applications:

aircraft parts
slitter knives
bearing races
pump parts and plungers
collets
bushings
spindles
grinding machines
precision instruments

"NICKEL-MOLY" TUBING

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LOW CARBON NICKEL-MOLY STEEL—A CARBURIZING STEEL WHICH GIVES HIGH SURFACE HARDNESS WITH A TOUGH CORE.

Typical applications:

piston pins
bearing races
farm equipment
knitting machinery
sleeves
bushings
pump parts
perforating guns

IMMEDIATE DELIVERY OF WAREHOUSE LOTS!

WHEN rush jobs call for a little tubing in a big hurry, get in touch with Timken®. Warehouse lots of Timken 52100 tubing and Timken "Nickel-Moly" tubing can be shipped to you within 24 hours after receipt of order.

These two general purpose steels have good hardenability and wear resistance. They'll do 9 out of 10 of your hollow-parts jobs. Timken 52100 steel can be heat treated to file hardness and tempered back to any point you want. It has through hardenability in moderate sections. Timken "Nickel-Moly" is a fine-grained, carburizing steel that develops exceptional shock-absorbing qualities when heat treated.

You can depend on uniform, high quality in every shipment, too. The Timken Roller Bearing Company maintains complete, rigid quality control through every step of manufacture. For the latest information on available sizes, grades and finishes, write for stock lists. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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Fine Alloy

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Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

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INTRAPLANT HAULAGE

TO MEET SPECIFIC — INDIVIDUAL TRANSFER PROBLEMS

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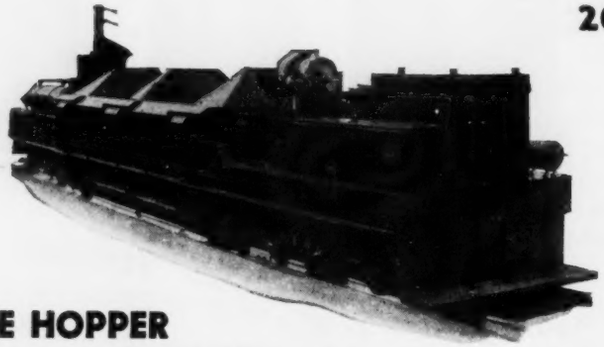
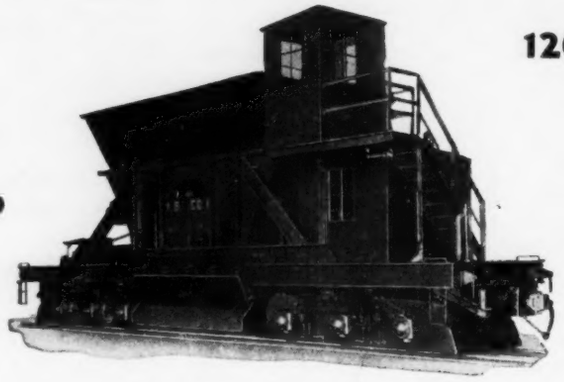


DOUBLE HOPPER BOTTOM DUMP SCALE CAR

120-TON

SIDE DUMP



ORE TRANSFER CAR

ATLAS BUILDS:—Scale Charging Cars and Ore Transfers; Indicating and Recording Dials for weighing scales; Electric and Storage Battery Locomotives; Coal Charging Cars; Door Extractors; Coke Quenching Cars; Turntables.

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IS ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.

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CALENDAR OF MEETINGS

† Denotes first listing in this column.

Oct. 9-11, National Academy of Sciences: Autumn meeting, General Electric research laboratory, Schenectady, N. Y. Address of NAS headquarters is 2101 Constitution Ave., Washington 7, D. C.

†Oct. 10, Joint Machine Tool Industry Mobilization Reserve Group: Meeting with representatives of all branches of machine tool industry, Royal York Hotel, Toronto, Canada. Chairman of group is Herbert L. Tigges, Baker Bros., Toledo, O.

Oct. 10-12, Society of Industrial Packaging and Materials Handling Engineers: 5th annual industrial packaging and materials handling exposition, Convention Hall, Philadelphia. Society is located at 20 W. Jackson Blvd., Chicago 4.

Oct. 11, American Iron & Steel Institute: Regional technical meeting, Hotel William Penn, Pittsburgh. Address of institute is 350 Fifth Ave., New York 1.

Oct. 11-13, Electrochemical Society: 98th meeting, Hotel Statler, Buffalo, N. Y. Society address: 235 W. 102nd St., New York 25.

Oct. 11-13, American Society of Civil Engineers: Fall meeting, Chicago. Headquarters of society are at 33 W. 39th St., New York 18.

Oct. 12-13, Foundry Equipment Manufacturers' Association: Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Association headquarters are in Engineers Bldg., Cleveland 14.

Oct. 12-13, Gray Iron Founders' Society: 22nd annual meeting, Netherland Plaza Hotel, Cincinnati, O. 210 National City-E. Sixth Bldg., Cleveland 14, is location of society.

Oct. 15-17, Conveyor Equipment Manufacturers Association: Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Association headquarters are at 1129 Vermont Ave. N. W., Washington 5, D. C.

Oct. 16-17, Boston Conference on Distribution. Hotel Statler, Boston. Sponsored by Boston Chamber of Commerce, 80 Federal St., Boston 10.

†Oct. 16-18, Southwide Chemical Conference: Meeting, Biltmore Hotel, Atlanta, Ga. Sponsored by American Chemical Society, 60 E. 42nd St., New York 17, and Southern Association of Science and Industry, Atlanta, Ga.

†Oct. 16-19, Society of Automotive Engineers: Transportation meeting, Hotel Statler, New York. Society headquarters are at 29 W. 39th St., New York 18.

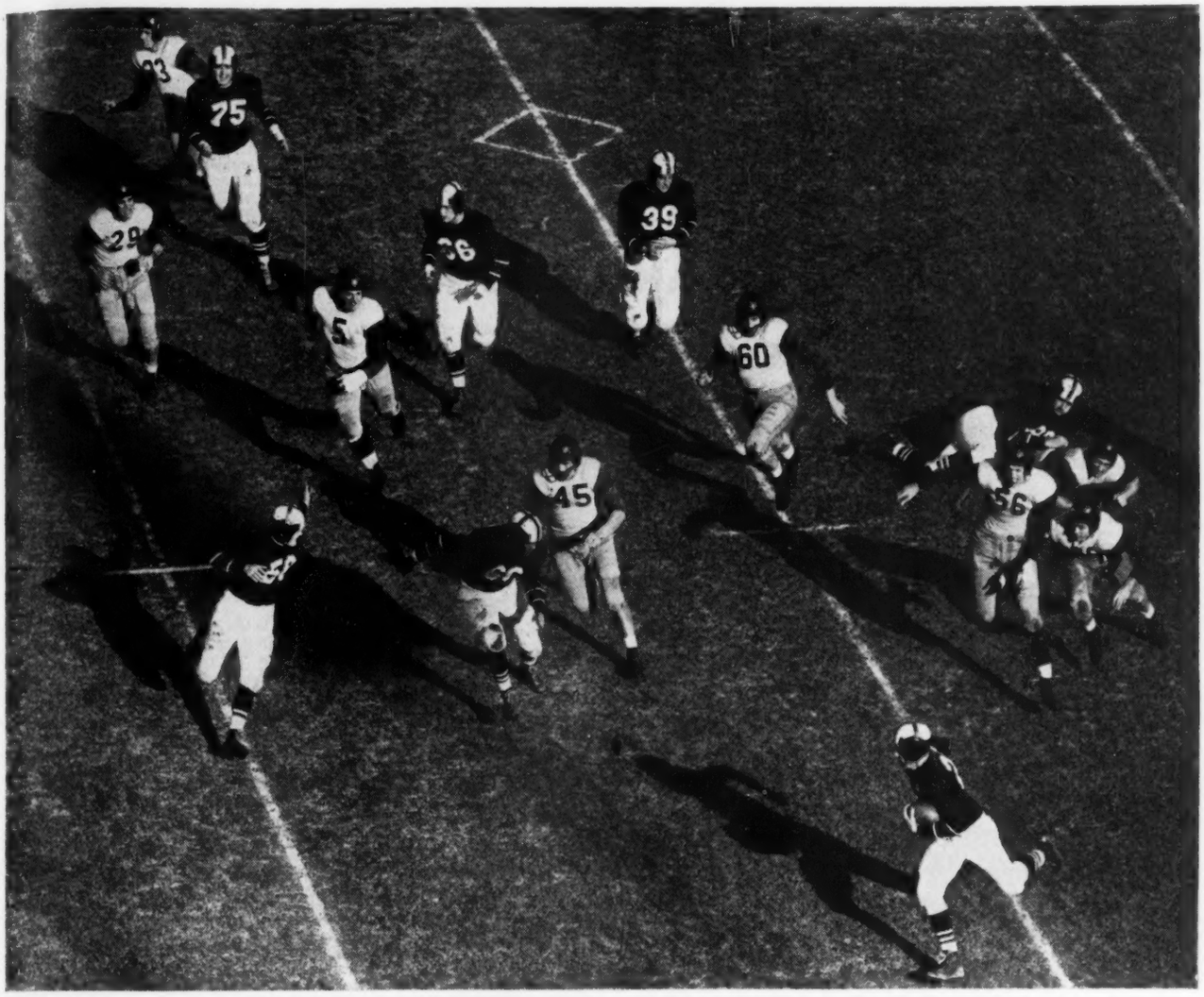
†Oct. 16-20, National Safety Council: 38th National Safety Congress and Exposition, Chicago. Meeting in Stevens, Congress, Morrison hotels. Council is located at 425 N. Michigan Ave., Chicago 11.

†Oct. 18-19, National Conference on Industrial Hydraulics: Sixth annual meeting, Sherman Hotel, Chicago. Sponsored by Armour Research Foundation and seven Chicago technical societies. Conference director: Otto J. Maha, Hannifin Corp., 621 S. Kolmer, Chicago 24.

†Oct. 18-19, Shock & Vibration Symposium: Sixteenth meeting, Armour Research Foundation, Chicago. Sponsored by Naval Research Laboratory, Washington 25, D. C.

†Oct. 18-20, Society of the Plastics Industry: Annual national conference, New Ocean House, Swampscott, Mass. Society headquarters: 295 Madison Ave., New York 17.

Oct. 23-25, American Institute of Electrical Engineers-Institute of Radio Engineers: Conference on electronic instrumentation in nucleonics and medicine, Park Sheraton Hotel, New York. AIEE address is 33 W. 39 St., New York 18; IRE is 1 E. 79th St., New York 21.



The Power of Competition

The snap of the ball, the competitive efforts of trained men, and suddenly a halfback breaks into the clear for a touchdown. Rugged competition on the gridiron thrills the crowd. More important, it builds strong bodies for young men.

Free competition strengthens industry, too, makes it healthy and ready for any emergency that may threaten our way of life. Wisconsin Steel believes in the power of competition. It has inspired us to increase our productive efficiency, and through research and quality control, to produce better products for our customers.

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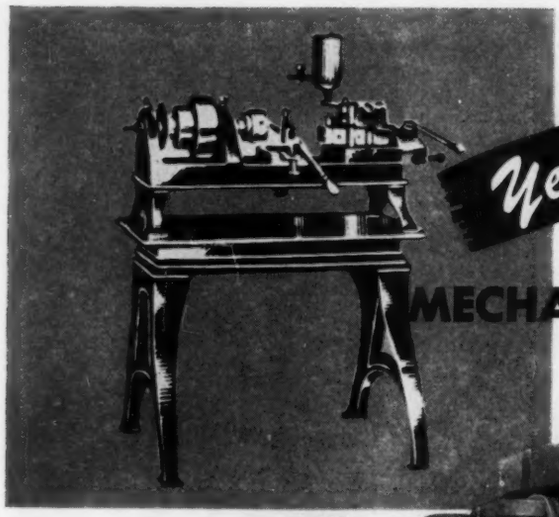
WISCONSIN STEEL COMPANY, Affiliate of INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue • Chicago 1, Illinois

WISCONSIN STEEL

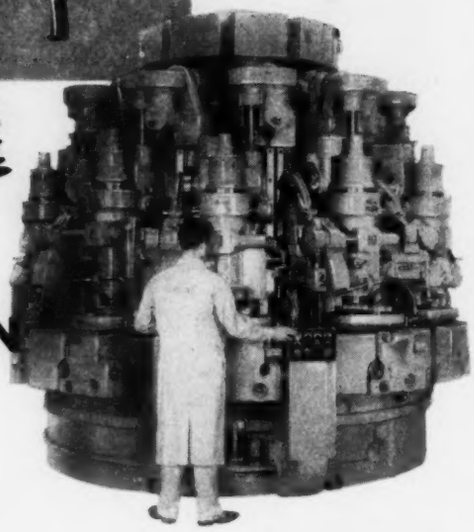


Yesterday

MECHANIZATION

Today

AUTOMATION



Always

STUART CUTTING FLUIDS
for HIGHER PRODUCTION

HIGHER SPEEDS! Greater feeds! Closer tolerances! Better finishes! New materials! Automatic operation! Lower costs! More production!

Those are the challenges D. A. Stuart Oil Co. has been helping the metal-working industry meet since 1865. *And, every moment of progress has spotlighted the critical importance of cutting fluids.* You will never get the production that is built into modern machine tools without the *best* cutting fluid for the job *properly applied.*

A Few Examples

- 150% increase in production on linemen's pliers *after* applying Stuart Oils on four operations.
- FEEDS, SPEEDS UPPED 50% on turret lathe operation after Stuart's SOLVOL was applied.
- 285 PIECES ground per wheel dressing since applying Stuart's SUPERKOOL 81, where only 20 pieces were obtained before. Now *full automatic* operation.

COME TO THE METAL SHOW in Chicago October 23-27. Bring your problems to Stuart Booth No. 328.

WRITE FOR "CUTTING FLUID FACTS"

D.A. Stuart Oil Co.

2735-37 S. Troy St., Chicago 23, Ill.

Oct. 23-26, American Institute of Steel Construction: Annual meeting, Shamrock Hotel, Houston, Tex. Institute address is 101 Park Ave., New York 17.

†**Oct. 23-26, Wire Association:** Annual convention, Lord Baltimore Hotel, Baltimore, Md. Association is located at 300 Main St., Stamford, Conn.

Oct. 23-27, American Institute of Electrical Engineers: Fall general meeting, Oklahoma City, Okla. Institute offices are at 33 W. 39th St., New York 18.

Oct. 23-27, National Metal Congress and Exposition, International Amphitheatre, Chicago, sponsored by American Society for Metals. Participating society addresses and Chicago headquarters: ASM, 7301 Euclid Ave., Cleveland, 3, Palmer House; American Welding Society, 29 W. 39 St., New York 18, Hotel Sherman; Institute of Metals Division, American Institute of Mining & Metallurgical Engineers, 29 W. 39th St., New York 18, Hotel Sheraton; Society for Non-Destructive Testing, Skokie, Ill., Morrison Hotel.

Oct. 24-25, Westinghouse materials handling conference, Hotel Statler, Buffalo, N. Y. For further information write Westinghouse Electric Corp., Box 1017, Pittsburgh 30.

Oct. 25, American Iron & Steel Institute: Regional technical meeting, Hotel Thomas Jefferson, Birmingham, Ala. Institute headquarters: 350 Fifth Ave., New York 1.

†**Oct. 26-28, Audio Engineering Society:** Technical sessions and Audio Fair, Hotel New Yorker, New York. Society Address: P. O. Box F, Oceanside, N. Y.

†**Oct. 27, Malleable Founders' Society:** Western Sectional Meeting, Drake Hotel, Chicago. Address of society: 1800 Union Commerce Bldg., Cleveland 14.

†**Oct. 29-31, American Gear Manufacturers Association:** Semiannual meeting, Edgewater Beach Hotel, Chicago. Association is located at Empire Bldg., Pittsburgh 22.

†**Oct. 29-Nov. 1, National Tool and Die Manufacturers Association:** Convention, Hotel Statler, Cleveland. Headquarters of association: 1412 Union Commerce Bldg., Cleveland 14.

†**Oct. 30-Nov. 1, National Lubricating Grease Institute:** Meeting, Edgewater Beach Hotel, Chicago. National offices at 4638 Mill Creek Parkway, Kansas City 2.

Oct. 31-Nov. 10, Short course in quality control by statistical methods, State University of Iowa, Iowa City, Iowa. Further information may be obtained from Lloyd A. Knowler, co-director, quality control program, the university.

†**Nov. 1-2, Porcelain Enamel Institute:** 19th annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters, 1010 Vermont Ave. N. W., Washington 5, D. C.

†**Nov. 1-2, Pennsylvania Society of Training Directors:** 4th annual conference, Community Building, Hershey, Pa. General chairman: T. G. Newton, Armstrong Cork Co., Lancaster, Pa.

†**Nov. 1-3, American Society of Body Engineers:** 5th annual technical convention, Rackham Memorial Building, Detroit. Headquarters of society at 100 Farnsworth, Detroit 2.

†**Nov. 2-3, Society of Automotive Engineers:** Diesel engine meeting, Hotel Knickerbocker, Chicago. Society headquarters are at 29 W. 39th St., New York 18.

†**Nov. 2-3, Third Annual Metals Casting Conference:** Sponsored by Michiana and Central Indiana Chapters, American Foundrymen's Society. To be held at Purdue University, Lafayette, Ind.

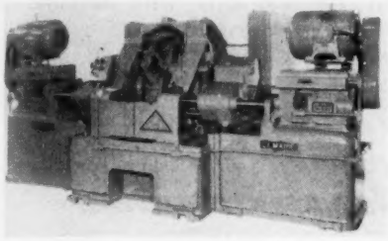
†**Nov. 2-3, Eighth Annual Conference on X-ray and Electron Diffraction:** To be held at Mellon Institute for Industrial Research, Pittsburgh 13.

†**Nov. 2-4, Industrial Management Conference:** Fourth annual meeting, University of Missouri, Columbia. Additional information from university Office of Public Information, Room 102, Building T-3, Columbia, Mo.

New Products and Equipment

Six-Spindle Drilling Machine

LeMaire Tool & Mfg. Co., 2657 S. Telegraph Rd., Dearborn, Mich., is building a two-way horizontal 6-spindle drilling machine with four-position trunnion for drilling, counterboring and reaming certain automotive parts. Machine consists of a fabricated steel center base which supports fixture trunnion and houses coolant tank, with two cast iron stand-



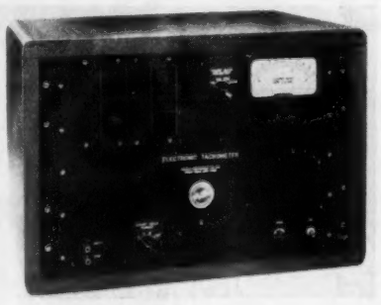
ard end bases, each of which supports a No. 5000 twin ram unit for driving and feeding 3-spindle head mounted on guide bars.

Trunnion carries four fixtures and is manually indexed. Indexing mechanism is interlocked with the hydraulic units in such a way that units will not operate if trunnion is not properly located with plugging bar in place, or if trunnion is indexed in the wrong direction. Fixtures are provided with ample chip clearance. Part is loaded at first station, drilled from both sides at second, counterbored from both sides at third and reamed from both sides at the fourth station.

Check No. 1 on Reply Card for more Details

It Counts the Revolutions

Number of counts from the source being measured during a precisely established time interval of 0.6-second are totaled by the high speed electronic counter tachometer, announced



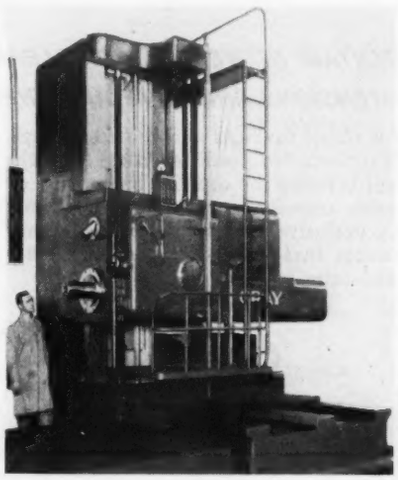
by Potter Instrument Co. Inc., 115 Cutter Mill Rd., Great Neck, N. Y. Reading is shown on a direct reading four digit electronic counter using ten neon glow lamps for each digit. After each measurement and display period, the instrument automatically resets and recycles. Display time is adjustable over a period of 0.5 to 4 seconds, or can be set to hold the time indefinitely.

Instrument can be made to measure frequencies up to 100,000 cycles per second with the accuracy of plus or minus one cycle. Unit also includes a count rate meter which can be used when the unknown frequency source is being adjusted. Use may be for high speed turbine, engine and motor speed measurements. Electromagnetic or photoelectric pick-up devices for detecting the speed without physical contact are available.

Check No. 2 on Reply Card for more Details

Floor Type Milling Machine

Utilizing heavy duty carbide milling cutters are 7 and 8-inch floor type horizontal boring, drilling and milling machines produced by G. A. Gray Co.,



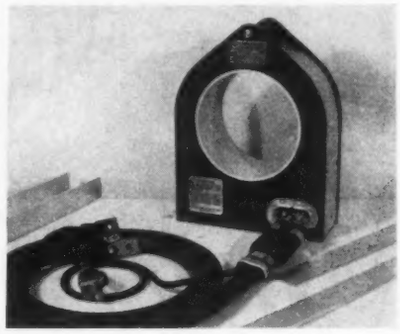
3611 Woodburn Ave., Cincinnati 7, O. Offered with 50 and 100 hp spindle motors, the machines bore and drill with 24 spindle speeds arranged in geometric progression up to 600 rpm on the 7 and 8-inch diameter spindle. Continuous bar feed and traverse up to 84 inches is available.

Two motors permit independent feeding of head and column. Pendant station control features automatic power clutch shifting and automatic hydraulic clamping. Spindle speeds may be quickly changed with the Insto-Shift device. Nonmetallic ways insure prolonged accuracy of the main guide surfaces of the score-free runway and column. The electric Woodpecker permits quick power positioning of the multi-ton head and column to an accuracy of 0.00025-inch or less.

Check No. 3 on Reply Card for more Details

Induction Heat Removes Pinions

Stubborn pinions may be removed easily and quickly without damage if you use an induction pinion heater



developed by National Electric Coil Co., Columbus 16, O. Device generates heat within the pinion; the surface is not overheated and the pinion may be removed with light pressure applied by means of either wedges or pinion puller.

Coil is slipped over the pinion and connected to the electric power supplied. It may be used wherever there is a source of 440 v, 300 amp, 60 cycle power. Opening which fits over the pinion may be ordered in a variety of sizes.

Check No. 4 on Reply Card for more Details

Cradle for Coils

Available in several capacities up to 15 tons is a line of coil cradles, manufactured by E. W. Bliss Co., Detroit, Mich. They may be equipped with special high friction cast iron or formica roll surfaces to minimize slippage on out-of-round coils. Rolls are mechanically driven through an adjustable speed drive. Main gears

are enclosed and splash lubricated. Rotary side guide plates mounted on roller bearings are adjusted manually.

Low entrance side of the cradle allows coils to be rolled onto the rolls by gravity from an inclined ramp. Release mechanism on the ramp per-

Why Bundyweld is

GOT a special must for the tubing you use?

Must it have greater strength? sturdier walls? less weight? be easier handling? take more bending?

The tougher your specifications, the greater the chance you'll fill the bill with Bundyweld Tubing. It's double-walled from a single strip; ideal for applications from A to Z.

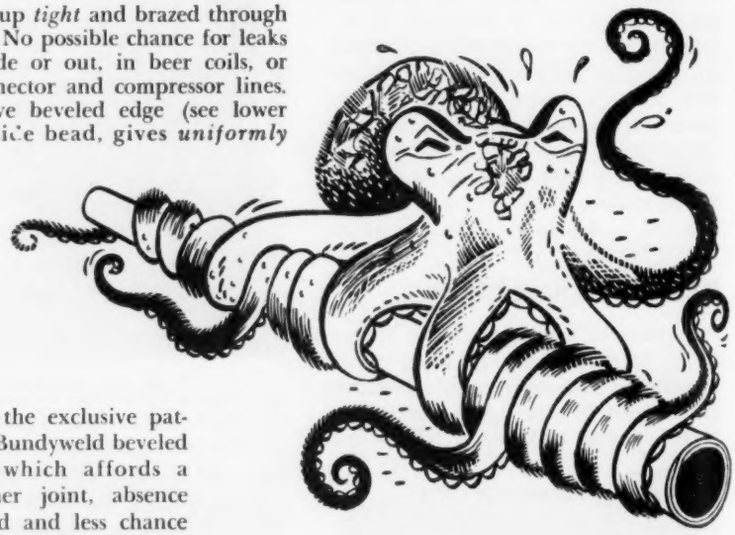
Just look over those Bundyweld pluses below!

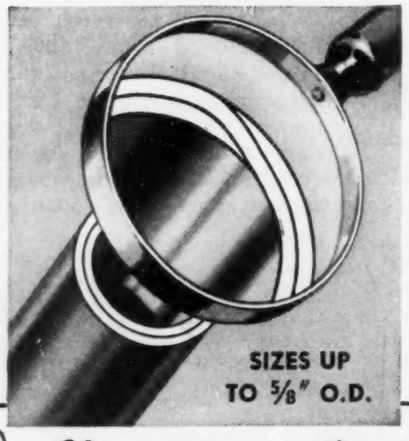
IT DUSTS OFF THE STRAIN OF BOTH SHIMMIES AND QUIVERS IN BRAKE LINES OF TRACTORS AND BUSES AND FLIVVERS.

Must your tubing part stand up under stress, strain, jolts and vibration? Most of today's cars feature brake lines of Bundyweld, finest evidence possible of the high resistance to vibration fatigue *you* can expect in extra-strong Bundyweld.

IT'S A BANTAM IN WEIGHT, WON'T LEAK UNDER STRESS; OUR DIMENSIONS ARE TRUE AND THERE'S NO SCALINESS.

Bundyweld is rolled up *tight* and brazed through 360° of wall contact. No possible chance for leaks under pressure, inside or out, in beer coils, or gas, refrigerant, connector and compressor lines. Bundyweld's exclusive beveled edge (see lower left) eliminates inside bead, gives *uniformly* pressure-proof tube.





NOTE the exclusive patented Bundyweld beveled edge, which affords a smoother joint, absence of bead and less chance for any leakage.

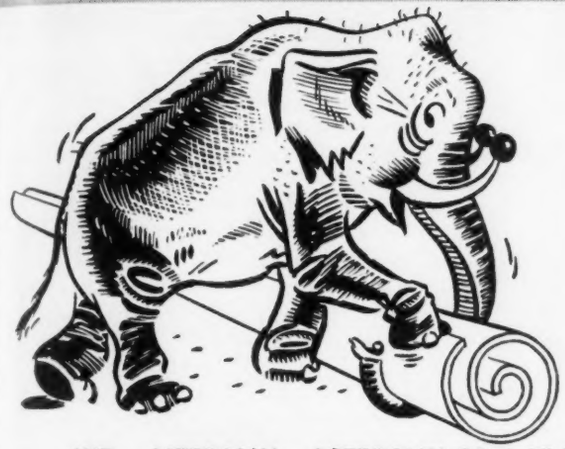
First, a single strip of basic metal, coated with a bonding metal, is . . .

rolled twice around into a tube of uniform thickness, then . . .

passed through a furnace. Bonding metal fuses with basic metal, presto—

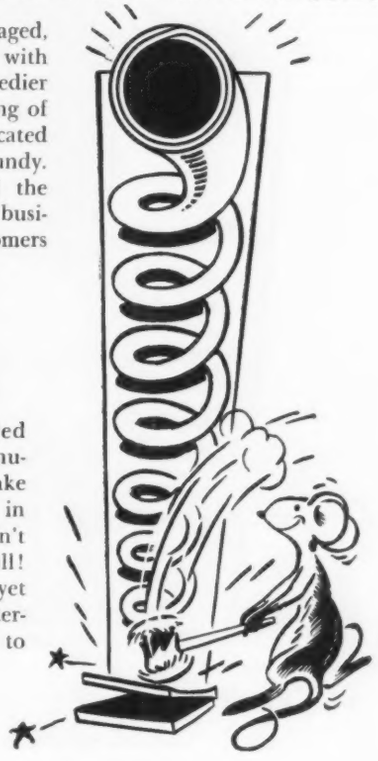
Bundyweld . . . double-walled and brazed through 360° of wall contact.

the ideal tubing

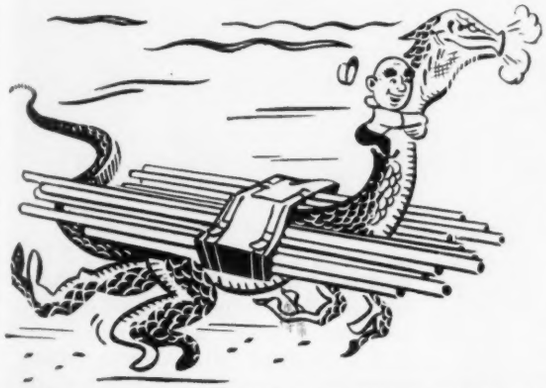


IT'S STURDY AND RUGGED, YET DUCTILE AS WELL,
FOR SMOOTH FABRICATION IT SURE RINGS THE BELL.

Bundyweld can be cut, swaged, formed, machined and joined with remarkable ease. You get speedier fabrication, lower costs. Speaking of forming, if you've a complicated bending problem, send it to Bundy. We've helped whip some of the toughest bending jobs in the business, with major savings to customers as well.



WE...LITERALLY...LATERALLY ROLL IT UP DOUBLE,
GAIN GREAT EXTRA STRENGTH THAT FREES YOU FROM TROUBLE.



An application of double-walled Bundyweld has helped many a manufacturer improve design or take production short-cuts . . . even in instances where the problem didn't seem to call for a tubing at all! Bundyweld is stronger walled, yet thinner walled; faster-heating, faster-cooling. I.D. and O.D. are held to amazingly close tolerances.

IF AN EXTRA-HOT JOB HAS YOUR PLANT IN A STEW,
PUT A CALL IN FOR BUNDY AND WATCH US CRASH THROUGH.

Customers praise Bundy service almost as much as Bundyweld Tubing itself. We'll practically do nip-ups to get to your place, talk over that stumper and turn out the order in jig time. And there's hardly a type of tubing application, be it in toys or tractors, that someone in our organization hasn't worked with before!

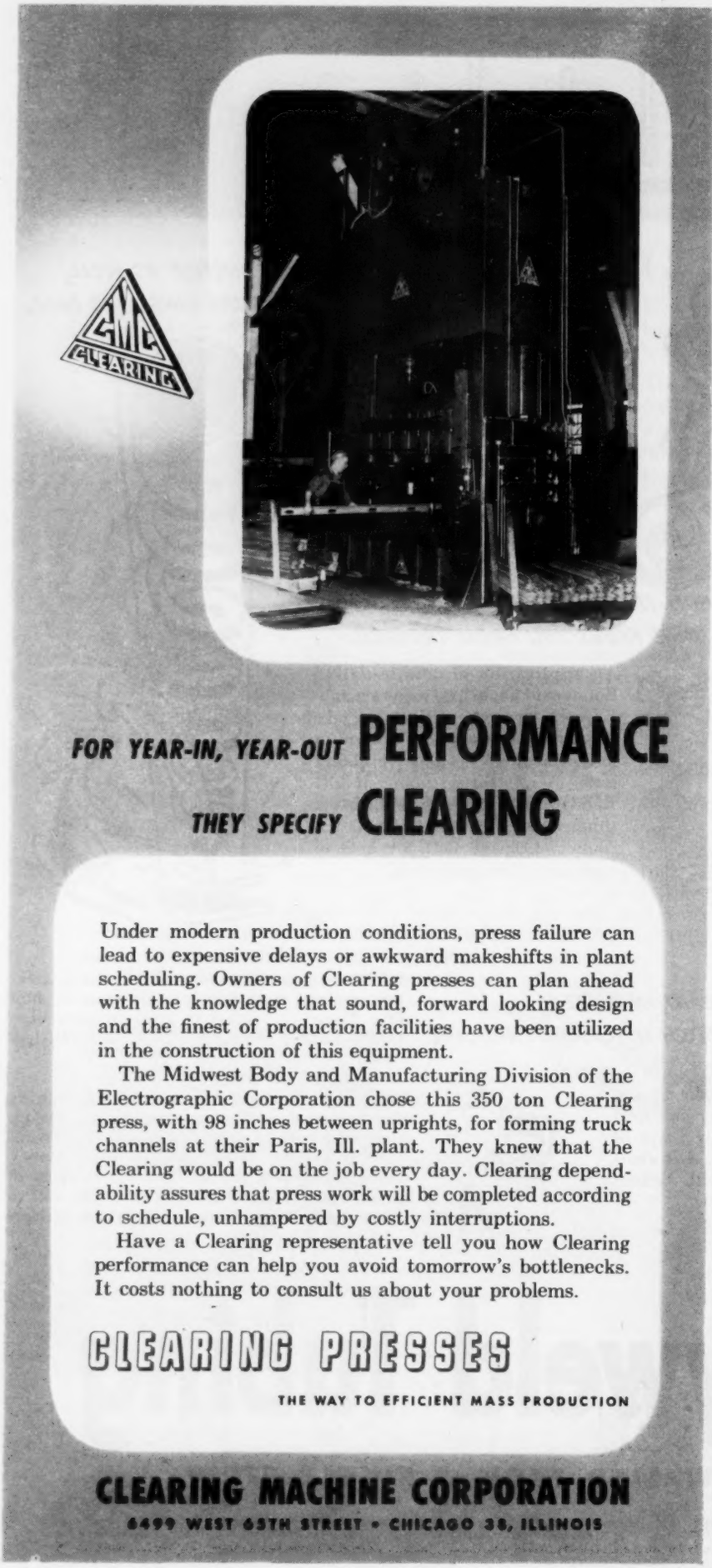
SO have your designers and engineers now
Get someone from Bundy to demonstrate how
Our Monel, or nickel or steel Bundyweld
Gives features and savings quite unparalleled.

FREE! The above only hints at all the features Bundyweld offers. Why not send for our 20-page illustrated booklet and get the full Bundyweld story. It may well help spark a major money-saving Bundyweld use for you. For booklet, or for any query on a use of tubing, just call or write: ***Bundy Tubing Company, Detroit 14, Michigan***

Bundyweld® Tubing

DOUBLE-WALLED FROM A SINGLE STRIP

Bundy Tubing Distributors and Representatives: ***Cambridge 42, Mass.:*** Austin-Hastings Co., Inc., 226 Binney St. • ***Chattanooga 2, Tenn.:*** Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg. • ***Chicago 32, Ill.:*** Lapham-Hickey Co., 3333 W. 47th Place • ***Elizabeth, New Jersey:*** A. B. Murray Co., Inc., Post Office Box 476 • ***Philadelphia 3, Penn.:*** Rutan & Co., 404 Architects Bldg. • ***San Francisco 10, Calif.:*** Pacific Metals Co., Ltd., 3100 19th St. • ***Seattle 4, Wash.:*** Eagle Metals Co., 3628 E. Marginal Way Toronto 5, ***Ontario, Canada:*** Alloy Metal Sales, Ltd., 881 Bay St. • **Bundyweld nickel and Monel tubing is sold by distributors of nickel and nickel alloys in principal cities.**



FOR YEAR-IN, YEAR-OUT **PERFORMANCE**

THEY SPECIFY **CLEARING**

Under modern production conditions, press failure can lead to expensive delays or awkward makeshifts in plant scheduling. Owners of Clearing presses can plan ahead with the knowledge that sound, forward looking design and the finest of production facilities have been utilized in the construction of this equipment.

The Midwest Body and Manufacturing Division of the Electrographic Corporation chose this 350 ton Clearing press, with 98 inches between uprights, for forming truck channels at their Paris, Ill. plant. They knew that the Clearing would be on the job every day. Clearing dependability assures that press work will be completed according to schedule, unhampered by costly interruptions.

Have a Clearing representative tell you how Clearing performance can help you avoid tomorrow's bottlenecks. It costs nothing to consult us about your problems.

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION

6499 WEST 65TH STREET • CHICAGO 38, ILLINOIS

mits preloading a number of coils at one time, making efficient use of material handling equipment and lessening possibility of shutdown while waiting for a coil to be loaded. Model illustrated has capacity of 10 tons and will handle stock 72 inches wide. Maximum feeding speed is 100 fpm.

Check No. 5 on Reply Card for more Details

Electric Hoist Trolley

Designed for attachment to standard lug-mounted electric hoists is the motor trolley, produced by Industrial Equipment Co., 315 N. Ada St., Chicago 7, Ill. Adjustable to accommodate a wide variety of beam sizes, the unit has crown-tread machine

steel wheels with hardened drivers. Each wheel is equipped with double-row ball bearings and a removable head axle fitted with Alemite grease fittings.

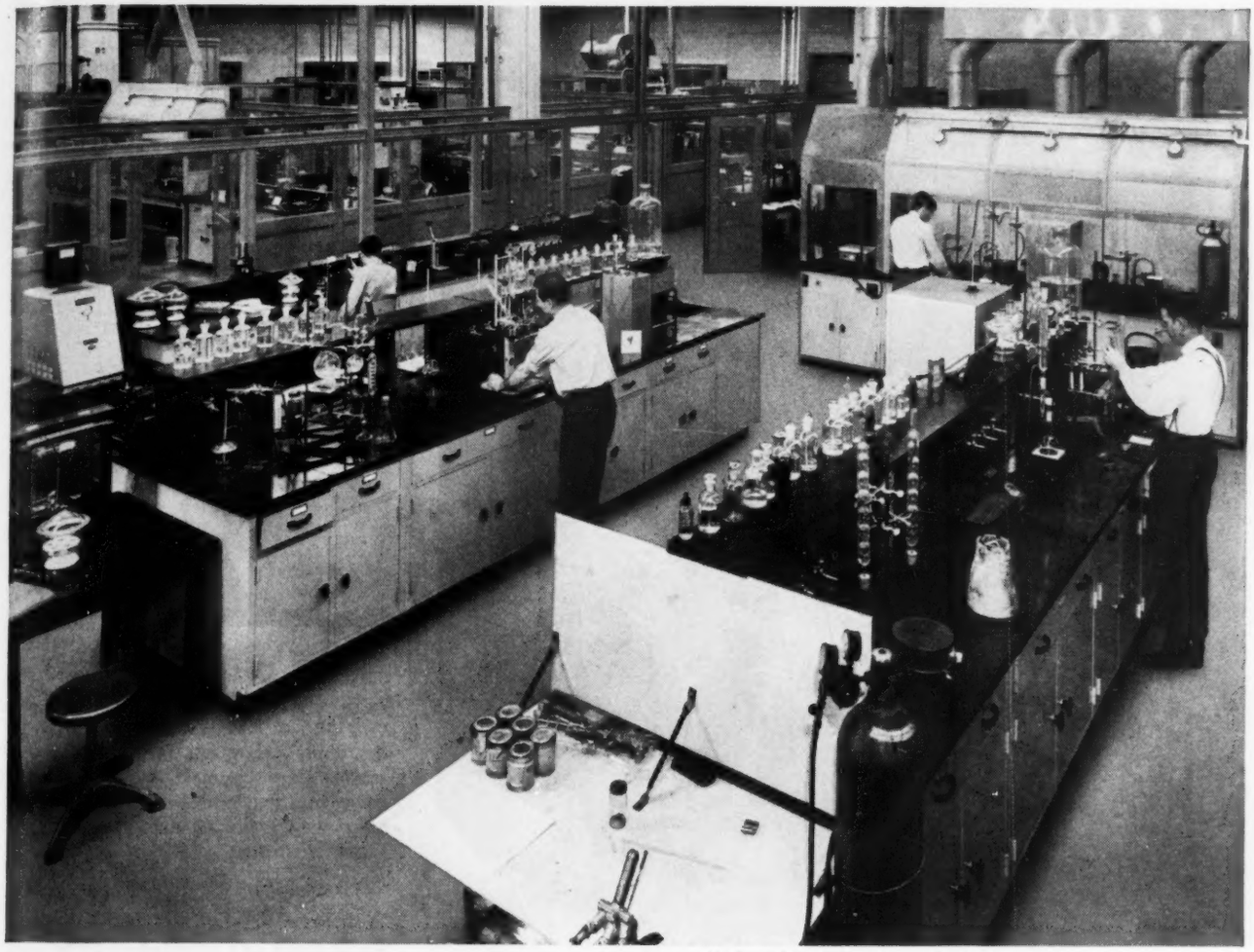
Trolley is powered by a crane-duty, high-torque, totally enclosed motor of 30-minute, 55-degree rating. Magnetic contact panel is equipped with a transformer to reduce voltage in the single speed pushbutton control circuit. A four-button control station operates the single speed trolley and hoist motions.

Check No. 6 on Reply Card for more Details

Run Nuts with This Tool

Running of nuts is performed with less operator fatigue and increased safety with the two air-operated Impactools, introduced by Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. Size 504 runs nuts up to ⅜-inch bolt size, while size 510 is for up to ¾-inch bolt size. Both have a pistol grip and are well balanced. Easy-to-grip reverse caps are deeply grooved for gripping by greasy hands.

Small but powerful vane type air motors are ample for difficult nut



Making laboratory analyses of grinding wheels and abrasive materials

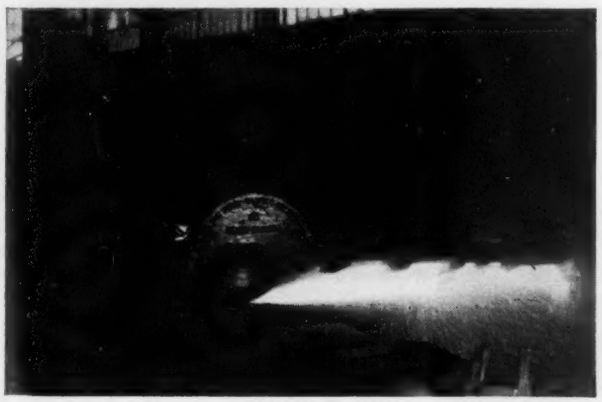
This is your grinding wheel laboratory

This is just one corner in the immense research and development laboratories of United States Rubber Company at Fort Wayne, Indiana.

Here "U. S." Abrasive Engineers work to lower your grinding wheel costs. They delve into every phase of bonds and abrasives, developing wheels that are more economical for snagging castings.

Their development work has revealed 5,000,000 possible combinations of size and construction. This means that they can produce the exact wheels you need for your conditions.

Take advantage of the "U. S." grinding wheel service. Write to address below.



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SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

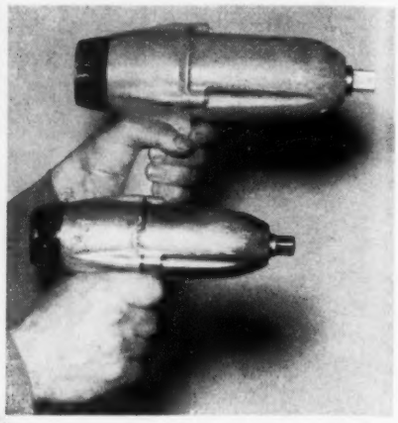
HERRINGBONE GEARS
by Horsburgh & Scott

● Here's why Horsburgh & Scott Herringbone gears are quiet and smooth running at all speeds . . . 1. Sykes type where two or more teeth are always in contact. 2. Teeth accurately generated on finest gear cutting machines with correct amount of backlash. 3. End thrust entirely eliminated. 4. Pitch line absolutely concentric with bore. 5. Rims, arms and hub extra heavy for pitch of gear. It will pay you to try these superb gears.

Send note on Company Letterhead for 488-Page Catalog 41

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

running jobs. The size 510 tool is a new model which makes it possible to have one hand free to hold work or pick up the next nut. Size 504 is a redesigned tool, 20 per cent more powerful and 65 per cent faster than the previous model. The latter

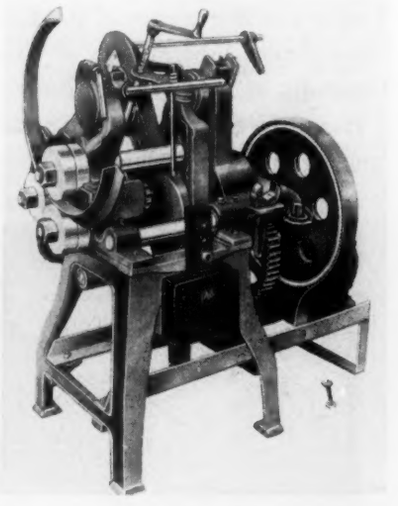


may also be used for step drilling to ¾-inch, reaming up to 9/16-inch, tapping up to ⅝-inch, and driving machine screws up to ⅜-inch. Hole sawing, broken stud and cap screw removing, masonry drilling and running wire brushes are other operations performed.

Check No. 7 on Reply Card for more Details

Rolls Part or Complete Circle

Various cross sections, such as angles, flats, pipes, rounds, squares, tees and channels, may be rolled into part or complete circles with the No.



14-R circular bending machine, a product of Excelsior Tool & Machine Co., 3100 Ridge Ave., East St. Louis, Ill. Pushbuttons on the front of the machine control forward, reverse and inching movement of rolls and stopping and starting. Machine has a

a cyclone was the hit of the show!

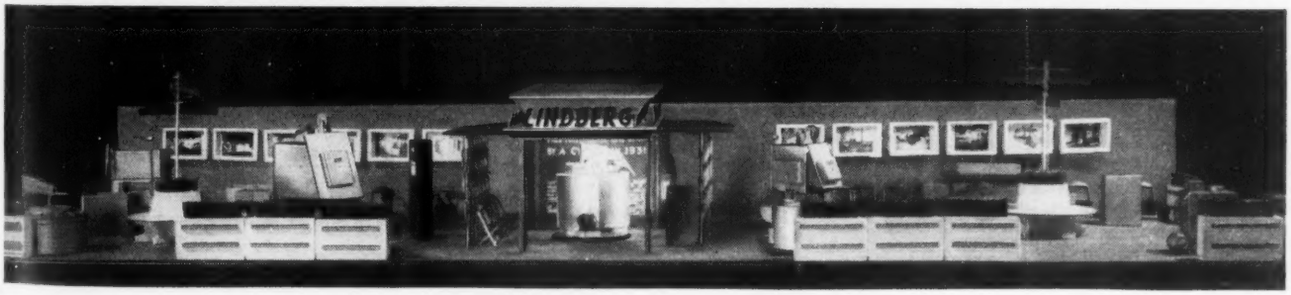
Back in '35 at the Amphitheatre in Chicago, Lindberg's CYCLONE Furnace was the hit of the show . . . because it brought to every heat treater a *new and better way to do his job!* The CYCLONE Furnace—our first product, was the first practical 100% forced convection furnace. It represents a basic improvement in existing equipment—it has never been successfully imitated.

Through the years we have grown in size and in the scope of the products we produce. We will have the products of eight divisions on display at this year's show—many of these products representing basic improvements in the tools of your trade.

on display:

HEAT TREATING FURNACES
MELTING FURNACES
HIGH FREQUENCY EQUIPMENT
ELECTRICAL EQUIPMENT
LABORATORY EQUIPMENT
AIR & HYDRAULIC EQUIPMENT
FABRICATION
AUTO ACCESSORIES

Be sure to see our exhibit—Booth #1204—National Metal Congress, Amphitheatre, Chicago, October 23—27, 1950



LINDBERG ENGINEERING COMPANY

2441 W. Hubbard Street • Chicago 12, Illinois

capacity of ¼ x 2 x 2-inch mild steel angles or equivalent.

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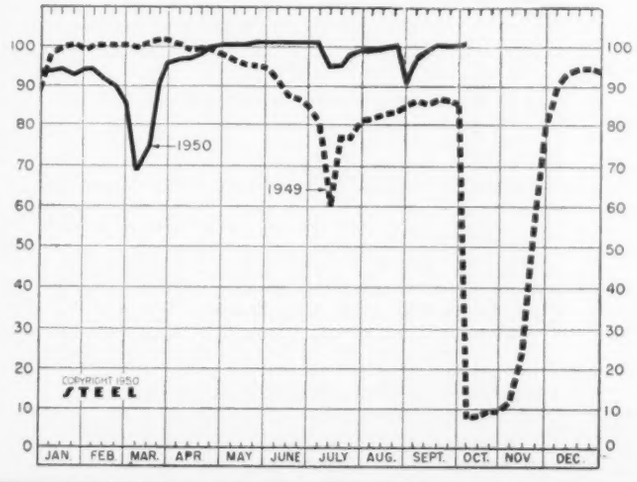

DISTRICT INGOT RATES

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Pittsburgh	102	+ 4*	3.5	95.5
Chicago	104	+ .5*	6	97.5
Eastern Pa.	99	0	7.5	94
Youngstown	106	0	0	104
Wheeling	99.5	+ 1.5	59	90
Cleveland	102	+ 2*	0	92
Buffalo	104	0	0	104
Birmingham	100	0	4	100
New England	82	0	52	87
Cincinnati	99	— 4	52	103
St. Louis	94	+ 2	84.5	91.5
Detroit	106	0	0	101
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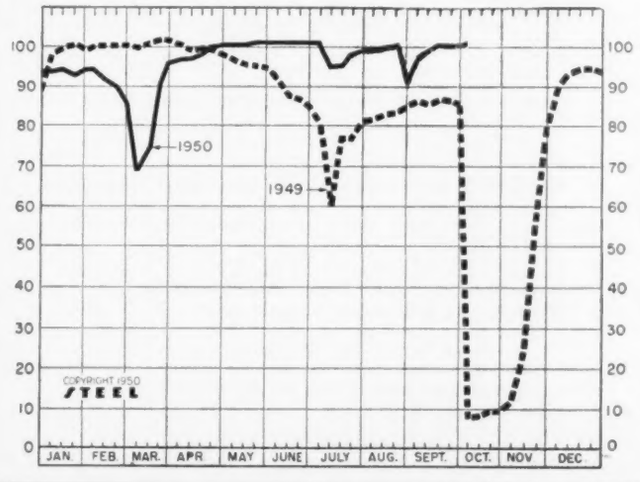

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Composite Market Averages

	Oct. 5 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	157.28	156.99	156.99	152.52	101.87
Index in cents per lb.	4.261	4.253	4.253	4.132	2.760
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$94.50	$94.50	$94.50	$91.55	$58.27
No. 2 Fdry, Pig Iron, GT	48.79	48.79	46.85	46.10	24.67
Basic Pig Iron, GT	47.72	47.72	45.97	45.60	24.00
Malleable Pig Iron, GT	49.20	49.20	47.49	47.27	25.29
Steelmaking Scrap, GT	41.00	41.00	41.08	27.25	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Oct. 5 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.45	3.45	3.45	3.35	2.25
Bars, H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, H.R., del. Philadelphia	3.93	3.93	3.93	3.83	2.57
Bars, C.F., Pittsburgh	4.10–15	4.10–15	4.10–15	3.95–4.00	2.75
Shapes, Std., Pittsburgh	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Shapes, del. Philadelphia	3.46	3.46	3.46	3.50	2.215
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa.	3.90	3.90	3.90	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del.	3.90	3.90	3.90	3.50	2.25
Plates, del. Philadelphia	3.84	3.84	3.84	3.59	2.30
Sheets, H.R., Pittsburgh	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh	3.50	3.50	3.50	3.25	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh	4.15–50	4.15–50	4.15–50	4.00	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00–15	2.90
Strip, C.R., Detroit	4.35–95	4.35–95	4.35–95	4.20–25	2.90
Wire, Basic, Pittsburgh	4.50–75	4.50	4.50	4.15	2.75
Nails, Wire, Pittsburgh	5.30–60	5.30	5.30	5.15	2.90
Tin plate, box, Pittsburgh	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Sheet bar, mill (NT)	58.00	58.00	58.00	56.00	36.00
Wire rods, 7/32-⅜", Pitts.	3.85	3.85	3.85	3.40	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$47-$50	$47-$50	$47-$50	$47.00	$26.19
Basic, Valley	46.00-49.00	46-49	46.00	46.00	24.50
Basic, del. Phila.	50.39	50.39	50.39	49.44	26.34
No. 2 Fdry, Pitts.	49.50	49.50	49.50	46.50	25.69
No. 2 Fdry, Chicago	46.50-49.50	46.50-49.50	46.50	46.50	25.00
No. 2 Fdry, Valley	49.50	49.50	46.50	46.50	25.00
No. 2 Fdry, del. Phila.	50.89	50.89	50.89	49.94	26.46
No. 2 Fdry, Birm.	45.88	45.88	42.38	39.38	21.38
No. 2 Fdry (Birm.) del. Cin.	52.58	52.58	49.08	45.43	25.30
Malleable, Valley	49.50	49.50	46.50	46.50	25.00
Malleable, Chicago	46.50-49.50	46.50-49.50	46.50	46.50	25.00
Charcoal, Lyles, Tenn.	62.00	62.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	175.00	140.33*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts.	$44.00	$44.00	$44.00	$29.75	$20.00
No. 1 Heavy Melt. E. Pa.	39.00	37.75	39.25	25.00	18.75
No. 1 Heavy Melt. Chicago	40.00	40.00	40.00	27.00	18.75
No. 1 Heavy Melt. Valley	43.75	43.75	43.75	31.25	20.00
No. 1 Heavy Melt. Cleve.	43.00	43.00	41.25	26.50	19.50
No. 1 Heavy Melt. Buffalo	41.50	41.50	39.75	28.25	19.25
Rails, Rerolling, Chicago	61.00	61.00	59.50	41.50	22.25
No. 1 Cast, Chicago	50.50	50.50	49.50	41.50	20.00

Coke, Net Ton

Beehive, Furn., Connlsvl.	$14.25	$14.25	$14.25	$13.25	$7.50
Beehive, Fdry., Connlsvl.	16.50	16.50	15.50	15.75	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.35

NONFERROUS METALS

Copper, del. Conn.	24.50	22.50-24.50	22.50-24.50	17.625	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	9.25	8.25
Lead, St. Louis	15.80	15.80	14.80	14.05	6.35
Tin, New York	106.00	102.50	99.00	96.00	52.00
Aluminum, del.	19.00	17.50-19.00	17.50	17.00	15.00
Antimony, Laredo, Tex.	32.00	32.00	28.50	38.50	14.50
Nickel, refinery, duty paid	48.00	48.00	48.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$48.00	$48.50	$49.00	$49.50
Brooklyn, N.Y., del.	....	52.79	53.29	....
Newark, del.	50.63	51.13	51.63	52.13
Philadelphia, del.	50.39	50.89	51.39	51.89
Birmingham District				
AlabamaCity, Ala. R2	45.38	45.88	....	....
Birmingham R2	45.38	45.88	....	....
Birmingham S9	45.38	45.88	....	....
Woodward, Ala. W15	45.38	45.88	....	....
Cincinnati, del.	....	52.58	....	....
Buffalo District				
Buffalo H1, R2	49.00	49.50	50.00	....
Tonawanda, N.Y., W12	49.00	49.50	50.00	....
N. Tonawanda, N.Y., T9	....	49.50	50.00	....
Boston, del.	58.26	58.76	59.20	....
Rochester, N.Y., del.	51.63	52.13	52.63	....
Syracuse, N.Y., del.	52.58	53.08	53.58	....
Chicago District				
Chicago I-3	49.00	49.50	49.50	50.00
Gary, Ind. C3	46.00	....	46.50	....
IndianaHarbor, Ind. I-2	46.00	....	46.50	....
So. Chicago, Ill. W14	49.00	49.50	49.50	....
So. Chicago, Ill. Y1	49.00	49.50	49.50	....
So. Chicago, Ill. C3	46.00	....	46.50	47.00
Milwaukee, del.	47.89	48.39	48.39	48.89
Muskegon, Mich., del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	49.00	49.50	49.50	....
Akron, del. from Cleve.	51.39	51.89	51.89	52.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	49.50	....
Erie, Pa. I-3	49.00	49.50	49.50	50.00
Everett, Mass. E1	....	52.25	52.75	....
Fontana, Calif. K1	52.00	52.50	....	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del.	....	54.20	....	....
LosAngeles, SanFrancisco, del.	53.70	54.20	....	....
GraniteCity, Ill. M10	50.90	51.40	51.90	....
St. Louis, del. (inc. tax)	51.65	52.15	52.65	....
Ironton, Utah C11	46.00	46.50	....	....
LoneStar, Tex. L6	45.00	*45.50	45.50	....
Minnequa, Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	49.50	49.50	50.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	50.69	50.69	51.19
McKeesRocks, del.	....	50.45	50.45	50.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	50.94	50.94	51.44
Verona, del.	....	51.40	51.40	51.90
Brackenridge, del.	....	51.63	51.63	52.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	....	....	49.50	50.00
Steelton, Pa. B2	48.00	48.50	49.00	49.50
Steubenville, O. W10	46.00	....	....	....
Swedeland, Pa. A3	50.00	50.50	51.00	51.50
Toledo, O. I-3	49.00	49.50	49.50	50.00
Cincinnati, del.	54.01	54.51	....	....
Troy, N.Y., R2	51.00	51.50	52.00	52.50
Youngstown District				
Hubbard, O. Y1	49.00	49.50	49.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	49.00	49.50	49.50	50.00
Mansfield, O., del.	50.26	53.76	53.76	51.26

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SIVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$57.00
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls, N.Y. P15	$78.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	82.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2	86.00
Wenatchee, Wash., OH & Fdry., frt. allowed K2	82.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$62.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton, Pa. B2	54.00
Philadelphia delivered	57.00
Troy, N.Y. R2	57.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL Oct. 5, 1950; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Fontana,Calif. K1 ....76.00
Munhall,Pa. C3 .....50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Fontana,Calif. K1 ....77.00
Houston,Tex. S5 .....59.00
Midland,Pa. C18 .....51.00
Munhall,Pa. C3 .....51.00
So.Duquesne,Pa. C3 ..51.00

BILLETS, BLOOMS & Slabs Carbon, Rerolling (NT)
Bessemer,Pa. C3 ....$53.00
Clairton,Pa. C3 .....53.00
Conshohocken,Pa. A3 ..62.00
Ensley,Ala. T2 .....53.00
Fairfield,Ala. T2 .....53.00
Fontana,Calif. K1 ....72.00
Gary,Ind. C3 .....53.00
Johnstown,Pa. B2 ....53.00
Lackawanna,N.Y. B2..53.00
Munhall,Pa. C3 .....53.00
So.Chicago,Ill. C3 ...53.00
So.Duquesne,Pa. C3 ...53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 .....$63.00
Buffalo R2 .....63.00
Canton,O. R2 .....63.00
Clairton,Pa. C3 .....63.00
Cleveland R2 .....63.00
Conshohocken,Pa. A3...68.00
Detroit R7 .....66.00
Ensley,Ala. T2 .....63.00
Fairfield,Ala. T2 .....63.00
Fontana,Calif. K1 ....82.00
Gary,Ind. C3 .....63.00
Geneva,Utah G1 .....63.00
Houston,Tex. S5 .....71.00
Ind.Harbor,Ind. I-2 ...63.00
Johnstown,Pa. B2 ....63.00
Lackawanna,N.Y. B2...63.00
LosAngeles B3 .....82.00
Munhall,Pa. C3 .....63.00
Seattle B3 .....82.00
So.Chicago C3,R2,W14.63.00
So.Duquesne,Pa. C3 ..63.00
So.SanFrancisco B3 ...82.00

Alloy (NT)
Bethlehem,Pa. B2 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2, T7 ....66.00
Conshohocken,Pa. A3..70.00
Detroit R7 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. C3 .....66.00
Houston,Tex. S5 .....74.00
Ind.Harbor,Ind. Y1 ...66.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....86.00
Massillon,O. R2 .....66.00
Midland,Pa. C18 .....66.00
Munhall,Pa. C3 .....66.00
Sharon,Pa. S3 .....66.00
So.Chicago C3,R2,W14.66.00
So.Duquesne,Pa. C3 ..66.00
Warren,O. C17 .....66.00
Youngstown Y1 .....66.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$76.00
Cleveland R2 .....76.00
Fontana,Calif. K1 ....100.00
Gary,Ind. C3 .....76.00
Ind.Harbor,Ind. I-2 ...76.00
Massillon,O. R2 .....76.00
So.Chicago,Ill. R2 ...76.00
So.Duquesne,Pa. C3 ...76.00

SHEETS BARS (NT)
Fontana,Calif. K1 ....$86.00

SKELP
Aliquippa,Pa. J5 .....3.25
Munhall,Pa. C3 .....3.15
Warren,O. R2 .....3.15
Youngstown C3, R2 ....3.15

WIRE RODS
AlabamaCity,Ala. R2 ..3.85
Buffalo W12 .....3.85
Cleveland A7 .....3.85
Donora,Pa. A7 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 ....4.60
Houston,Tex. S5 .....4.25
Ind.Harbor,Ind. Y1 ...3.85
Johnstown,Pa. B2 ....3.85
Joliet,Ill. A7 .....3.85
LosAngeles B3 .....4.65
Minnequa,Colo. C10 ....4.10
Monessen,Pa. P7 .....4.05
No.Tonawanda,N.Y. B11.3.85
Pittsburg,Calif. C11 ...4.50
Portsmouth,O. P12 ....3.85
Roebling,N.J. R5 .....3.95
So.Chicago,Ill. R2 .....3.85
SparrowsPoint,Md. B2..3.95
Sterling,Ill.(1) N15 ....3.85
Struthers,O. Y1 .....3.85
Torrance,Calif. C11 ...4.65
Worcester A7 .....4.15

STRUCTURALS

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ...3.40
Aliquippa,Pa. J5 .....3.40
Bessemer,Ala. T2 .....3.40
Bethlehem,Pa. B2 .....3.45
Clairton,Pa. C3 .....3.40
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 ....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Houston,Tex. S5 .....3.80
Ind.Harbor,Ind. I-2 ....3.40
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.00
Lackawanna,N.Y. B2 ...3.45
LosAngeles B3 .....4.00
Minnequa,Colo. C10 ...3.75
Munhall,Pa. C3 .....3.40
Niles,Calif.(22) P1 ....4.02
Phoenixville,Pa. P4 ....4.25
Portland,Oreg. O4 ....4.05
Seattle B3 .....4.05
So.Chicago,Ill. C3, W14.3.40
So.SanFrancisco B3 ....3.95
Torrance,Calif. C11 ....4.00
Weirton,W.Va. W6 ....3.40

Alloy Stand. Shapes
Clairton,Pa. C3 .....4.05
Fontana,Calif. K1 ....5.25
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 ....4.05

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.15
Bessemer,Ala. T2 .....5.15
Bethlehem,Pa.(14) B2...5.20
Clairton,Pa. C3 .....5.15
Fairfield,Ala. T2 .....5.15
Fontana,Calif. K1 ....5.75
Gary,Ind. C3 .....5.15
Geneva,Utah G1 .....5.10
Ind.Harbor,Ind. I-2, Y1.5.15
Johnstown,Pa. B2 ....5.20
Lackawanna,N.Y.(14)B2 5.20
LosAngeles B3 .....5.75
Munhall,Pa. C3 .....5.15
So.Chicago,Ill. C3 .....5.15
So.SanFrancisco B3 ....5.70
Struthers,O. Y1 .....5.40

Wide Flange
Bethlehem,Pa. B2 .....3.45
Lackawanna,N.Y. B2 ...3.45
Munhall,Pa. C3 .....3.40
So.Chicago,Ill. C3 ....3.40

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.20
Lackawanna,N.Y. B2 ..5.20
Munhall,Pa. C3 .....5.10
So.Chicago,Ill. C3 .....5.10

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.20
Lackawanna,N.Y. B2 ...4.20
Munhall,Pa. C3 .....4.20
So.Chicago,Ill. C3 .....4.20
Weirton,W.Va. W6 ....4.20

BEARING PILES
Munhall,Pa. C3 .....3.40
So.Chicago,Ill. C3 .....3.40

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.35
Bessemer,Ala. T2 .....5.35
Clairton,Pa. C3 .....5.35
Cleveland J5, R2 .....5.35
Conshohocken,Pa. A3 ..5.35
Ecorse,Mich. G5 .....5.60
Fairfield,Ala. T2 .....5.35
Fontana,Calif. K1 ....5.95
Gary,Ind. C3 .....5.35
Geneva,Utah G1 .....5.35
Ind.Harbor,Ind. I-2, Y1.5.35
Johnstown,Pa. B2 .....5.35
Munhall,Pa. C3 .....5.35
Pittsburgh J5 .....5.35
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. C3 ....5.35
SparrowsPoint,Md. B2..5.35
Warren,O. R2 .....5.35
Youngstown Y1 .....5.60

PLATES, Open-Hearth Alloy
Claymont,Del. W16 ....4.50
Coatesville,Pa. L7 ....4.80
Conshohocken,Pa. A3 ...4.55
Fontana,Calif. K1 ....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 .....4.40
Munhall,Pa. C3 .....4.40
Sharon,Pa. S3 .....4.75
So.Chicago,Ill. C3 .....4.40
SparrowsPoint,Md. B2 ..4.40

FLOOR PLATES
Cleveland J5 .....4.55
Conshohocken,Pa. A3 ..4.55
Harrisburg,Pa. C5 ....5.25
Ind.Harbor,Ind. I-2 ....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 ....4.55

PLATES (Universal Mill)
Fontana,Calif. K1 ....4.40

PLATES, Carbon A.R.
Fontana,Calif. K1 ....5.25

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.50
Aliquippa,Pa. J5 .....3.50
Ashland,Ky.(15) A10 ..3.50
Bessemer,Ala. T2 .....3.50
Clairton,Pa. C3 .....3.50
Claymont,Del. W16 ....3.90
Cleveland J5 R2 .....3.50
Coatesville,Pa. L7 ....3.90
Conshohocken,Pa. A3 ..3.75
Ecorse,Mich. G5 .....3.75
Fairfield,Ala. T2 .....3.50
Fontana,Calif. K1 ....4.10
Gary,Ind. C3 .....3.50
GraniteCity,Ill. G4 .....4.20
Geneva,Utah G1 .....3.50
Harrisburg,Pa. C5 ....4.25
Houston,Tex. S5 .....3.90
Ind.Harbor,Ind. I-2, Y1..3.50
Johnstown,Pa. B2 .....3.50
Lackawanna,N.Y. B2 ..3.50
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.50
Pittsburgh J5 .....3.50
Seattle B3 .....4.40
Sharon,Pa. S3 .....3.75
So.Chicago,Ill. C3, W14.3.50
SparrowsPoint,Md. B2 ..3.50
Steubenville,O. W10 ....3.50
Warren,O. R2 .....3.50
Weirton,W.Va. W6 ....3.50
Youngstown C3, R2, Y1.3.50

PLATES, Wrought Iron
Economy,Pa. B14 ....7.85

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ...3.75
Ashland,lcl(15) A10 ...4.25
Cleveland,cl R2 .....4.10
Warren,O.cl R2 .....4.10

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.45
Aliquippa,Pa. J5 .....3.45
Alton,Ill(1) L1 .....3.45
Atlanta,Ga. A11 .....3.60
Bessemer,Ala. T2 .....3.45
Buffalo R2 .....3.45
Canton,O. R2 .....3.45
Clairton,Pa. C3 .....3.45
Cleveland R2 .....3.45
Ecorse,Mich. G5 .....3.65
Emeryville,Calif. J7 ....4.20
Fairfield,Ala. T2 .....3.45
Fontana,Calif. K1 ....4.10
Gary,Ind. C3 .....3.45
Houston,Tex. S5 .....3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.05
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.15
Milton,Pa. B6 .....3.70
Minnequa,Colo. C10 ....3.85
Niles,Calif. P1 .....4.17
N.Tonawanda,N.Y. B11.3.45
Pittsburg,Calif. C11 ...4.15
Pittsburgh J5 .....3.45
Portland,Oreg. O4 ....4.20
Seattle B3, N14 .....4.20
So.Chicago C3, R2, W14.3.45
So.Duquesne,Pa. C3 ....3.45
S.SanFran.,Cal. B3 ....4.20
Struthers,O. Y1 .....3.45
Torrance,Calif. C11 ....4.15
Weirton,W.Va. W6 ....3.45
Youngstown C3, R2 ....3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.45
Atlanta A11 .....3.60
Johnstown,Pa. B2 .....3.45
Lackawanna,N.Y. B2 ..3.45
Niles,Calif. P1 .....4.17
Pittsburgh(23) J5 .....3.45
Portland,Oreg. O4 ....4.20
SanFrancisco S7 .....4.00
Weirton,W.Va. W6 ....3.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2, T7 .....3.95
Clairton,Pa. C3 .....3.95
Ecorse,Mich. G5 .....4.25
Fontana,Calif. K1 ....4.95
Gary,Ind. C3 .....3.95
Houston,Tex. S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 ....3.95
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....5.00
Massillon,O. R2 .....3.95
Midland,Pa. C18 .....3.95
So.Chicago C3, R2, W14.3.95
So.Duquesne,Pa. C3 ...3.95
Struthers,O. Y1 .....3.95
Warren,O. C17 .....3.95
Youngstown C3 .....3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 .....4.20
Fontana,Calif. K1 ....4.95
Gary,Ind. C3 .....4.20
Youngstown C3 .....4.20

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.20
Atlanta A11 .....5.35
Bessemer,Ala. T2 .....5.20
Bethlehem,Pa. B2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland R2 .....5.20
Ecorse,Mich. G5 .....5.40
Fairfield,Ala. T2 .....5.20
Fontana,Calif. K1 ....6.25
Gary,Ind. C3 .....5.20
Ind.Harbor,Ind. I-2, Y1.5.20
Johnstown,Pa. B2 .....5.20
Lackawanna,N.Y. B2 ..5.20
LosAngeles B3 .....5.90
Pittsburgh J5 .....5.20
So.Duquesne,Pa. C3 ....5.20
So.SanFrancisco B3 ...5.95
Struthers,O. Y1 .....5.45
Youngstown C3 .....5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 .....4.15
Ambridge,Pa. W18 ....4.15
BeaverFalls,Pa. M12,R2.4.15
Buffalo B5 .....4.15
Camden,N.J. P13 .....4.60
Carnegie,Pa. C12 .....4.15
Chicago W18 .....4.15
Cleveland A7, C20 ....4.15
Detroit P17 .....4.30
Donora,Pa. A7 .....4.15
Ecorse,Mich. G5 .....4.35
Elyria,O. W8 .....4.15
FranklinPark,Ill. N5 ....4.15
Gary,Ind. R2 .....4.15
Hammond,Ind. L2, M13.4.15
Hartford,Conn. R2 ....4.55
Harvey,Ill. B5 .....4.15
LosAngeles R2 .....5.55
Mansfield,Mass. B5 ....4.55
Massillon,O. R2, R8 ...4.15
Midland,Pa. C18 .....4.15
Monaca,Pa. S17 .....4.15
Newark,N.J. W18 .....4.55
Plymouth,Mich. P5 ....4.40
Pittsburgh J5 .....4.10
Putnam,Conn. W18 ....4.55
Readville,Mass. C14 ...4.55
St.Louis,Mo. M5 .....4.55
So.Chicago,Ill. W14 ....4.15
SpringCity,Pa.(5) K3 ..4.55
Struthers,O. Y1 .....4.15
Waukegan,Ill. A7 .....4.15
Youngstown F3, Y1 ....4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 .....4.90
Ambridge,Pa. W18 ....4.90
BeaverFalls,Pa. M12 ....4.90
Bethlehem,Pa. B2 .....4.90
Buffalo B5 .....4.90
Canton,O. R2, T7 .....4.90
Carnegie,Pa. C12 .....4.90
Chicago W18 .....4.90
Cleveland A7, C20 ....4.90
Detroit P17 .....5.05
Donora,Pa. A7 .....4.90
Elyria,O. W8 .....4.90
Gary,Ind. R2 .....4.90
Hammnod,Ind. L2, M13.4.90
Hartford,Conn. R2 ....5.20
Harvey,Ill. B5 .....4.90
Lackawanna,N.Y. B2 ..4.90
Mansfield,Mass. B5 ....5.20
Massillon,O. R2, R8 ...4.90
Midland, Pa. C18 .....4.90
Monaca,Pa. S17 .....4.90
Newark,N.J. W18 .....5.20
Plymouth,Mich. P5 ....5.10
So.Chicago,Ill. R2, W14.4.90
Struthers,O. Y1 .....4.90
Warren,O. C17 .....4.90
Waukegan,Ill. A7 .....4.90
Worcester,Mass. A7 ....5.20
Youngstown F3, Y1 ....4.90

RAIL STEEL BARS
ChicagoHts.(3)I-2, C2 .....4.00
ChicagoHts.(4) I-2 ....3.45
ChicagoHts.(3) C-2 ....4.00
Dallas,Tex.(4) S20 ....6.00
Franklin,Pa.(3) F5 ....4.00
FortWorth,Tex.(26) T4..4.63
Huntngtn,W.Va.(3) W7.4.00
Marion,O.(3) P11 .....4.00
Moline,Ill.(3) R2 .....3.55
Williamsport(3) S19 ...4.25

BARS, Wrought Iron
Economy,Pa.(S.R.) B14..8.60
Economy,Pa.(D.R.)B14 11.00
Economy(Staybolt)B14 11.30
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 .12.25
McK.Rks.(S.R.) L5 ...8.60
McK.Rks.(D.R.) L5 ..11.25

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.45
Alton,Ill(6) L1 .....3.45
Atlanta A11 .....3.60
Buffalo R2 .....3.45
Cleveland R2 .....3.45
Emeryville,Calif. J7 ..4.20
Fairfield,Ala. T2 .....3.45
Fontana,Calif. K1 ....4.10
Gary,Ind. C3 .....3.45
Houston,Tex. S5 .....3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.05
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.15
Milton,Pa. B6 .....3.70
Minnequa,Colo. C10 ....4.25
Niles,Calif. P1 .....4.17
Pittsburg,Calif. C11 ...4.15
Pittsburgh J5 .....3.45
SandSprings,Okla S5 ..4.35
Seattle B3, N14 .....4.20
So.Chicago,Ill. R2 ....3.45
So.Duquesne,Pa. C3 ....3.45
So.SanFrancisco B3 ....4.20
SparrowsPoint,Md. B2 .3.45
Struthers,O. Y1 .....3.45
Torrance,Calif. C11 ....4.15
Youngstown C3, R2 ....3.45

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 .4.50
Johnstown, ¼-1" B2 ...4.35
LosAngeles B3 .....5.00
Marion,O. P11 .....4.75
Seattle B3, N14 .....5.10
So.SanFrancisco B3 ...5.00
SparrowsPt., ¼-1" B2 .4.35
Williamsport,Pa. S19 ..4.35

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.35
Ashland,Ky.(8) A10 ...3.35
Butler,Pa. A10 .....3.35
Cleveland J5, R2 .....3.35
Conshohocken,Pa. A3 ..3.60
Detroit M1 .....4.15
Ecorse,Mich.(8) G5 ....3.55
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 ....4.25
Gary,Ind. C3 .....3.35
GraniteCity,Ill. G4 .....4.05
Geneva,Utah G1 .....3.45
Ind.Harbor,Ind. I-2, Y1.3.35
Irvin,Pa. C3 .....3.35
Lackawnna,N.Y. B2 ...3.35
Munhall,Pa. C3 .....3.35
Niles,O. N12 .....4.50
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Sharon,Pa. S3 .....3.75
So.Chicago,Ill. W14 ....3.35
SparrowsPoint,Md. B2 .3.35
Steubenville,O. W10 ....3.35
Torrance,Calif. C11 ....4.05
Warren,O. R2 .....3.35
Weirton,W.Va. W6 ....3.35
Youngstown C3, Y1 ....3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 ..4.50
Dover,O. R1 .....4.65
Ind.Harbor,Ind. I-2 ....4.40
Mansfield,O. E6 .....4.15
Niles,O. N12 .....5.00
Torrance,Calif. C11 ....5.15

SHEETS, H-R (14 ga., heavier) High-strength Low-Alloy
Cleveland J5, R2 .....5.05
Conshohocken,Pa. A3 ..5.05
Ecorse,Mich. G5 .....5.25
Fairfield,Ala. T2 .....5.05
Fontana,Calif. K1 ....6.74
Gary,Ind. C3 .....5.05
Ind.Harbor,Ind. I-2, Y1.5.05
Irvin,Pa. C3 .....5.05
Lackawanna(35) B2 ..5.05
Pittsburgh J5 .....5.05
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. C3 .....5.05
SparrowsPoint(36) B2 ..5.05
Warren,O. R2 .....5.05
Weirton,W.Va. W6 ....5.05
Youngstown, C3 .....5.05
Youngstown, Y1 .....5.30

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.20
Ecorse,Mich. G5 .....6.40
Fontana,Calif. K1 ....7.05
Gary,Ind. C3 .....6.20
Ind.Harbor,Ind. I-2, Y1.6.20
Irvin,Pa. C3 .....6.20
Lackawanna(37) B2 ....6.20
Pittsburgh J5 .....6.20
SparrowsPoint(38) B2..6.20
Warren,O. R2 .....6.20
Weirton,W.Va. W6 ....6.20
Youngstown Y1 .....6.45

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	*4.80*
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky. (8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	*5.10*
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo, Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	*5.50*
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	*6.05*

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	*5.30*
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

BLUED STOCK, 29 Ga.

Yorkville,O. W10	6.00
Follansbee,W.Va.(23)F4	*5.70*

SHEETS, Culvert No. 16 Corrugated Ingot Iron

	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45
Fairfield,Ala. T2	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Wrought Iron

	An'l	Galv.
Apollo,Pa. B14	12.00	15.50

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif. C11	4.05

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Well Casing

Fontana,Calif. K1	4.80

TIN PLATE, American COKE (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary C3	7.30	7.50
Ind.Harbor I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10.	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	*5.75*
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	*5.10*
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	5.70
Sharon,Pa. S3	*5.30*
So.SanFrancisco(25) B3	5.70
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	*5.45*
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.25
Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.50
Buffalo(27) R2	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.50
Conshohocken,Pa. A3	3.50
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.50
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.50
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	*3.75*
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.50
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Fontana,Calif. K1	11.15
Harrison,N.J. C18	9.50
NewBritn.Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	*10.10*
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.50	5.95	6.55	8.50	10.80
Bristol,Conn. W1	...	...	6.85	8.80	....
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.80
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	4.15	5.95	6.55	8.50	10.80
FranklinPark,Ill. T6	4.50	6.10	6.70	8.65	....
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.50	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	4.15	5.95	6.55	8.50	....
NewCastle,Pa. E5	4.50	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. N8:					
Cleve-or-Pitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	*4.85*	*6.30*	*6.90*	*8.85*	*11.15*
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.15	5.95	6.55	8.50	10.80
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	4.50
Berea,O. C7	6.50
Bridgeprt,Conn.(10) S15	4.50
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.75
Detroit D2	4.75
Detroit M1	4.95
Dover,O.(40) G6	4.50
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	*4.85*
Fontana,Calif. K1	5.75
FranklinPark,Ill. T6	4.50
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.85
Mattapan,Mass. T6	5.00
Middletown, O. A10	4.15
New Britain(10) S15	4.50
NewCastle,Pa. B4	4.50
NewCastle,Pa.(40) E5	4.50
NewHaven,Conn. D2	5.00
NewHaven,Conn. A7	4.65
NewYork W3	5.00
Pawtucket,R.I. R3	5.15
Pawtucket,R.I.(21) N8	5.00
Riverdale,Ill. A1	4.50
Rome,N.Y. R6	4.15
Sharon,Pa. S3	*4.85*
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	5.00
Wallingford,Conn. W2	5.00
Warren,O.(40) T5	4.50
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown C8, (40)	4.50
Youngstown Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	*6.55*
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Dover,O. G6	4.50
Weirton,W.Va. W6	4.15
Youngstown C8	4.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill. G4(cut lengths)			*7.40*	*8.65*	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	*6.50*	*7.00*	...	...
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	....
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	....	....	....
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.20	14.70
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac.Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.

C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.MillsCo.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta A11	3.40
Riverdale,Ill. A1	3.40
Sharon,Pa. S3	*3.90*
Youngstown C3	3.40

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill.(1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Millbury,Mass.(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Williamsport,Pa. B2	6.00
Worcester A7,J4,T6,W12	6.20
Worcester,Mass. N6	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	5.35
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. M8	5.35
Dover,O. G6	5.35
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P16	5.35
Monessen,Pa., P7	*5.60*
Pawtucket,R.I.(12) N8	6.00
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. M8	8.45
Fostoria,O. S1	8.45
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7,T6	8.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.55
Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.05	8.05	8.30
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P16	8.05	8.05	8.30
Monessen,Pa. P7	*8.30*	*8.30*	*8.55*
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20, R2	4.50
Crawfordsville,Ind. M8	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O.(24) S1	4.85
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.60
LosAngeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	*4.75*
Newark, 6-8ga. I-1	5.15
No. Tonawanda B11	4.50
Palmer, Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. A7	4.80
Worcester,Mass. T6	4.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.15
Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.45
SparrowsPoint,Md. B2	8.25

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	*5.35*	*5.80*
Atlanta A11	5.45	5.70
Bartonville(19) K4	5.35	5.60
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.60
Crawfordsvil. M8	5.45	5.70
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy.Mo. S5	5.95	6.20
Kokomo C16	5.45	5.70
LosAngeles B3	6.30	...
Minnequa C10	5.60	5.85
Monessen P7	*5.60*	*5.85*
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.30	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So.Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.55
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1) N15	*5.35*	*5.85*
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	5.65	5.90

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Aliquippa J5	*9.80*	*11.50*
Bartonville(1) K4	9.80	11.30
Cleveland A7	9.80	11.30
Crawfrdvil. M8	9.80	11.30
Fostoria,O. S1	9.90	11.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	10.05	11.80
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11	10.15	11.65
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	*130*
Atlanta A11	128
Bartonville,Ill.(19) K4	126
Crawfordsville M8	*132*
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo. C10	131
Monessen,Pa. P7	*134*
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	146
SparrowsPoint,Md. B2	128
Sterling,Ill.(1) N15	*133*

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	125
Duluth A7	116
Franklin,Pa. F5	125
Huntington,W.Va. W7	116
Johnstown,Pa. B2	116
Joliet,Ill. A7	116
Marion,O. P11	*128*
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	130

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,Pa. 9-14½ ga.J5	*120*
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. M8	118
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.6" B2	190
Johnstn,17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity,Mo. S5	128
Kokomo,Ind. C16	118
Minnequa,Colo. C10	121
Monessen,Pa. P7	*123*
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116
Sterling,Ill.(1) N15	116

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	*119*
Chicago W13	113
Crawfordsville M8	115
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	113

AXLES

Ind.Hardor,Ind. S13	5.25
Johnstown,Pa. B2	5.25

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	4.00

NAILS & STAPLES, Stock To dealers & Mfrs. (7) Col.

AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	*110*
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	111
Crawfordsville,Ind. M8	*112*
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	*112*
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	*111*
Torrance,Calif. C11	126
Worcester,Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. M8	*5.65*
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Seattle B3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	9.10
Pittsburgh O3, P14	9.10
Seattle B3	9.35

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N5 Nelson Steel & Wire Co.
N6 New Eng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50-31.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, T7, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) 3" & wider; over ½" to under 3" 5.50c.
(14) Also wide flange beams.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 4 cars.
(24) Deduct 0.35c for finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, to fabricators (⅜" bar, also fork, billet, 5.03c); to consumers, 5.28c.
(27) Bar mill sizes.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 25 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 Ga. & lighter; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 4.75c, 0.035" and heavier.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	36.5	34.5	33.5	5.5	3.5	5.5
¼	6.0	0.42	33.5	31.5	30.5	5.5	3.5	6.5
⅜	6.0	0.57	29.0	27.0	26.0	0.5	+1.5	2.5
½	8.5	0.85	40.5	38.5	39.5	21.0	19.0	20.0
¾	11.5	1.13	43.5	41.5	42.5	25.0	23.0	24.0
1	17.0	1.68	46.0	44.0	45.0	28.0	26.0	27.0
1¼	23.0	2.28	46.5	44.5	45.5	28.5	26.5	27.5
1½	27.5	2.73	47.0	45.0	46.0	29.0	27.0	28.0
2	37.0	3.68	47.5	45.5	46.5	29.5	27.5	28.5
2½	58.5	5.82	48.0	46.0	47.0	30.0	28.0	29.0
3	76.5	7.62	48.0	46.0	47.0	30.0	28.0	29.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 points lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N.3; Youngstown, plus 43% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1.

Column D: Monaca, Pa. quotes 1 pt lower on ½" through 3", P9; Sharon, Pa. M6, quotes 2½ pts. lower on ⅛", 1½ pts lower on ⅜" and 3½ pts lower on ½" through 3"; Butler, Pa. ⅛" through ⅜" F6; Benwood, W. Va. W10 except 3½ pts lower on ⅛", 2½ pts lower on ¼", 3 pts lower on ⅜", 2½ lower on ½", 3½ lower on ¾, 1¼, 1½ and 2", 3 lower on 2½ and 3", and 4 lower on 1" Wheatland, Pa., except 2 pts lower on ⅛", ¼" and ⅜"; W9. Following make ½" and larger: Lorain, N3; Youngstown, plus 24.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5 and Etna, Pa. N2 quote 2½ pts lower on ½", 3½ lower on ¾", 1¼", 1½", and 2", 3 lower on 2½" and 3", and 4 lower on 1". Fontana, Calif. K1 quotes 8 pts lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Seamless— Black A	Galv. B	—Elec. Weld— Black C	Galv. D
2	37.0c	3.68	36.0	17.5	36.0	17.5
2½	58.5	5.82	39.0	20.5	39.0	20.5
3	76.5	7.62	39.0	20.5	39.0	20.5
3½	92.0	9.20	41.0	22.5	41.0	22.5
4	$1.09	10.89	41.0	22.5	41.0	22.5
5	1.48	14.81	41.0	22.5	41.0	22.5
6	1.92	19.18	41.0	22.5	41.0	22.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 2½ points lower; Lorain, N3; Youngstown, Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	—Elec. Weld— H.R.	C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2¼	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3½	11	35.87	42.22	34.79	40.95

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding	—Plates— Carbon Base		—Strip— Cold-Rolled Carbon Base		—Sheets— Carbon Base 10%	20%	Copper Base Both Sides
Stainless	10%	20%	10%	Both Sides			
302	....	....	....	....	19.75	21.50–24.00	75.00
304	23.50	26.50–28.00	....	....	20.75–23.50	22.50–25.5	77.00
305	....	....	....	....	....	....	79.00
309	29.00	33.50	....	....	....	....	....
310	35.00	39.50	....	....	....	....	105.00
316	28.00	31.00–32.50	....	....	26.00	28.00–34.5	....
317	33.00	37.50	....	....	....	....	....
318	32.00	36.50	....	....	....	....	....
321	25.00	29.50	....	....	23.00	25.00	90.00
347	26.00	29.00–30.50	....	....	24.00	26.00–31.5	94.00
405	19.75	26.25	....	....	....	....	....
410	19.25	25.75	....	....	....	....	....
430	19.25	25.75	....	....	....	....	....
Nickel	31.00	41.00	33.50	45.00	....	....	88.00
Inconel	39.00	51.00	....	....	....	....	140.00
Monel	32.00	42.00	....	....	....	....	83.00
Copper*	....	....	21.45†	27.15‡	....	....	....

* Deoxidized. † 17.95c for hot-rolled. ‡23.90c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	27
⅝-in. & ⅞-in.	29
1-in. and larger	26
Longer than 6 in.:	
All diams.	22
Lag bolts, all diams.:	
6 in. and shorter	30
over 6 in. long	28
Ribbed Necked Carriage	26
Blank	40
Plow	40
Step, Elevator, Tap, and Sleigh Shoe	28
Tire bolts	20
Boiler & Fitting-Up bolts	37

NUTS

H.P. & C.P. Reg. & Heavy Square:	
⅛-in. and smaller	25
¼-in. & ⅝-in.	23
¾-in.-1½-in.	23
1⅝ in. and larger	16

H.P. Hex.:	Reg.	Heavy
½-in. & smaller	33	29
⅝-in. & ⅞-in..	28	25
¾-in.-1½-in. ..	25	23
1⅝ in. & larger	17	16

C.P. Hex:		
½-in. & smaller	33	29
⅝-in. & ⅞-in..	30	27
¾-in. & 1½ in.	27	24
1⅝ in. & larger	20	17

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Hvy.	Reg.	Lght.
½-in. and smaller	35	41	41
⅝-in. & ⅞-in.	30	36	36
¾-in.-1½-in.	27	31	33
1⅝-in.&larger	17	21	..

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	63.5 & 10
Plated finishes	50 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	50
¾-in. through 1 in.	43
Longer than 6 in.:	
¼-in. through ⅝-in.	33
¾-in. through 1 in.	13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	46
1 in. and smaller diam. x over 6 in.	33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	41
¼-in. diam. & larger	24
N.F. thread, all diams.	18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger	7.25c
⅞-in., under	43 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List to 50c off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

—Inches— Diam.	Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	39.00	32.00	30.00
302	39.00	34.50	30.00
303	41.00	38.00	32.50
304	41.00	36.50	31.50
309	53.50	52.50	43.00
316	54.50	56.50	47.50
321	47.00	46.00	35.50
347	51.50	50.00	40.00
410	34.50	28.50	24.50
416	35.00	35.00	25.00
420	42.00	45.00	30.00
430	37.00	29.00	25.00
501	25.50	24.00	13.00
502	26.50	25.00	14.00

Baltimore, Types 301 through 347 sheet, except 309 E2.

Baltimore, bars, wire and structurals A10.

Brackenridge, Pa., sheets A4.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., strip except Type 416, S18.

Cleveland, strip A7.

Detroit, strip, except Types 303, 309, 321, 416, 420, 501 and 502 M1.

Dunkirk,N.Y., bars, wire A4.

Duquesne, Pa., bars C3.

Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.

Gary, Ind., sheets except Type 416 C3.

Harrison, N. J., strip C18.

Harrison, N. J., Types 302, 304, 316 wire and strip D6.

Massillon, all products R2.

McKeesport,Pa., bars; sheets except Type 416 C3.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars C3.

Pittsburgh, sheets C18.

Reading, Pa., bars & strip C4.

So. Chicago, Ill., bars & structurals C3.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.

Washington, Pa., bars, sheets & strip J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 59.50c, strip 61.50c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & Wire A7.

West Leechburg, Pa., strip, A4.

Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol	30.00-32.00
Toluol, one deg.	21.00-28.00
Industrial xylol	21.00-29.50
Per ton bulk, ovens	
Sulphate of ammonia	$32-45
Cents per pound, ovens	
Phenol, 40 (carlots, non-returnable drums)	17.25
Do., less than carlots	18.00
Do., tank cars	15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $41; less than 60%, $38.

Imported, net ton, duty paid, metallurgical grade, $28-$29.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge Iron:	Cents
98+% Fe, carlots	35.00
Swedish, c.i.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	33.50
Unannealed, 99+% Fe	33.50
Unannealed 99+% Fe(minus 325 mesh)	43.50
Powder Flakes	44.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	70.00-133.00
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500 lb drums, freight allowed	30.00
Brass, 10-ton lots	28.50-31.25
Copper:	
Electrolytic	33.75
Reduced	33.50
Lead	20.50
Manganese:	
Minus 100-mesh	52.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel unannealed	75.50
Nickel-Silver, 10-ton lots	41.75
Silicon	34.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302	75.00
Tin	$1.20
Zinc, 10-ton lots	20.50-28.00
Tungsten:	Dollars
99%, minus 80 to 200 mesh, freight allowed:	
over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb	3.00
98.8% minus 65 mesh, freight allowed:	
1000 lb and over	2.90
less than 1000 lb	3.00
Molybdenum:	
99%, minus 80 to 200 mesh	
over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb	2.75
82-88%, freight allowed	
2000 lb and over	2.40
less than 2000 lb	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll.fur.	$14.00-14.50
Connelsvll.fdry.	16.00-17.00
New River, foundry	19.00
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.00
Everett, Mass., ovens	
New England, del.	23.40
Chicago, ovens	21.00
Chicago del.	22.45
Detroit, del.	24.91
Terre Haute, ovens	21.20
Milwaukee, ovens	23.00
Indianapolis, ovens	20.75
Chicago, del.	24.12
Cincinnati, del.	23.67
Detroit, del.	24.65
Ironton, O., ovens	20.40
Cincinnati, del.	22.71
Painesville, O., ovens	21.00
Buffalo, del.	24.02
Cleveland, del.	23.62
Erie, del.	22.04
Birmingham, ovens	19.15
Birmingham, del.	20.20
Philadelphia, ovens	21.25
Neville Island Pa., ovens	22.00
Swedeland, Pa., ovens	21.20
St. Louis, ovens	22.09
St. Louis, del.	24.15
Portsmouth, O., ovens	20.15
Cincinnati, del.	22.71
Detroit, ovens	21.65
Detroit, del.	*22.65
Buffalo, del.	24.69
Flint, del.	24.09
Pontiac, del.	23.04
Saginaw, del.	24.40

Includes representative switching charge of: *, $1.00; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York(city)	5.82	6.84	7.84	6.14	...	5.97	6.64	8.60	5.95	6.18	7.84
New York(c'try)	5.52	6.64	7.54	5.84	...	5.67	6.34	8.70	5.65	5.88	7.34
Boston (city) ..	5.95	6.75	7.89	5.90	...	5.80	6.39	8.70	5.95	6.38	7.48
Boston (c'try) .	5.75	6.55	7.69	5.70	...	5.60	6.19	8.50	5.75	6.38	7.28
Phila. (city) ..	6.60-6.70	6.75	7.20	5.90	...	5.85	6.46	8.40	5.70	5.90	7.00
Phila. (c'try) ..	6.35-6.45	6.50	6.95	5.65	...	5.60	6.21	8.15	5.45	5.65	6.75
Balt. (city) ...	5.35	6.59	6.77	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try) ..	5.15	6.39	6.57	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va. ..	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va..	5.55	...	6.80	5.83	...	5.73	6.30	...	5.83	5.65	7.33
Wash. (w'hse) .	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.) ..	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††§	5.55	5.55	7.15
Buffalo (w'hse).	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††§	5.35	5.35	6.95
Pitts. (w'hse)..	5.15	5.95*	6.70-6.95	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse)	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††§	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.50	5.44	6.15	5.32	5.95	8.31	5.57	5.72	6.52
Cleve. (w'hse).	5.15	5.95	7.30	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city) ..	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city) .	5.35	6.15	7.15	5.30	...	5.30	5.85	9.75††§	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.95	5.10	...	5.10	5.65	9.55††§	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	7.29	5.44	...	5.44	6.09	9.89††§	5.59	5.74	6.94
Milwau. (c'try).	5.29	6.09	7.09	5.24	...	5.24	5.89	9.69††§	5.39	5.54	6.74
St. Louis (del.)	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††§	5.78	5.93	7.13
St. L. (w'hse) .	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††§	5.58	5.73	6.93
Kans. City(city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.05	6.20	7.60
KansCity(w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr. .	6.131	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.30	6.10	6.30‡	5.25	...	5.25	6.88	...	5.40	5.55	7.83
Birm'hm(w'hse)	5.15	5.95	6.15‡	5.10	...	5.10	...	...	5.25	5.40	
Los Ang. (city)	6.10	7.65	7.90	6.15	8.90	6.10	7.75	...	6.10	6.20	8.40
L. A. (w'hse)..	5.90	7.45	7.70	5.95	8.70	5.90	7.55	...	5.90	6.00	8.20
San Francisco .	6.50#	7.60‡	7.50‡	7.45#	8.25‡	6.30#	7.55	...	6.30#	6.40#	8.50#
Seattle-Tacoma .	6.60	8.15‡	...	6.85	...	6.35	8.50	10.10	6.20	6.35‡	8.40‡

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ²—500 to 1499 lb; ³—450 to 1499 lb; ⁴—1000 to 1999 lb; ⁵—300 to 999 lb; ⁶—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $106. Hard-fired, $142 at above points.

High-Heat Duty: Salina, Pa. $91; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., $72; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., Chester, W. Va., New Cumberland, W. Va., $60.

Wire Cut: Chester, W. Va., Wellsville, O., New Cumberland, W. Va., $58.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., $96; Ottawa, Ill., $90; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $68; chemical-bonded chrome brick, $72; magnesite brick, $94; chemical-bonded magnesite, $83.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅝" grains; bulk, $33; single paper bags, $38.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Bonne Terre, Mo., Blue Bell, Williams, Millville, W. Va., Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Mo., $12.45; Martin, Millersville, Narlo, Clay Center, and Bettsville, O., Billmeyer, Plymouth Meeting, Pa., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Chinese	$36.00
Brazilian	36.00
Bolivian	36.00
Domestic scheelite, del.	36.00

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $70, Palmerton, Pa.; $71, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces, $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%), Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 29.75c; ton lot 31.25c; less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(Please turn to page 140)

Demand for Metals Remains Heavy

United Nation's successes in Korea have not reduced buying interest in copper, zinc and aluminum. Prices in these markets are still strong

FOURTH - QUARTER business in nonferrous metals opened with price trend continuing upward and demand heavy, especially for copper, zinc and aluminum. Based on prospective military needs, stockpiling requirements and heavy consumption in consumer goods industries, producers foresee no immediate easing in availability of supplies.

The aircraft industry, for instance, is taking about 22 per cent of the aluminum production of Kaiser's Trentwood rolling mill near Spokane, Wash. Before the Korean war only about 7 per cent of the plant's output was being channeled to plane makers. Kaiser officials say shipments to civilian consumers are steadily falling behind orders. Before the step-up in military demand, the Trentwood mill was working around the clock to meet ordinary demands.

Copper—Prices are firmly established at 24.50c for electrolytic. Substantial premiums are being paid in the gray market by some consumers. Brass mill product prices are now based on that quotation for copper and 17.50c for zinc, plus ½-cent a pound of copper content to cover the imported copper duty.

Brass Ingot—Shipments of ingot brass and bronze were higher in August than they have been in any month for more than four years, Brass & Bronze Ingot Institute, Chicago, reports.

The August figure of 29,689 net tons also is considerably above the 12-month averages for 1947, 1948 and 1949, as the accompanying chart shows. The high level of August pushed the monthly average for 1950 up to 22,751 tons. July shipments had been only 21,609 tons.

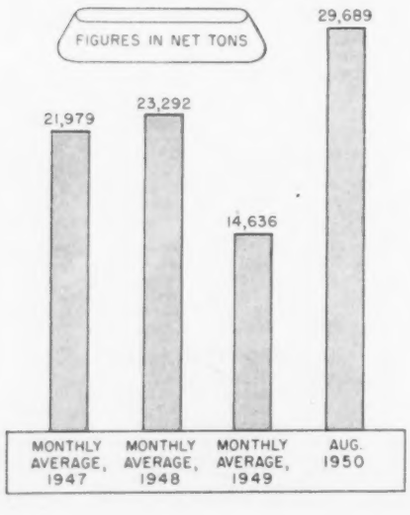
Zinc—With demand for zinc exceeding supplies, consumers are fearful that orders carrying a priority rating eventually will result in sharp cutbacks in their receipts of the metal. Sellers are reviewing the orders already on their books and will await developments before deciding on the procedure to follow in handling priority business. They are hopeful that the tonnage involved will be small.

Lead—Demand for lead is somewhat more active with satisfactory bookings being made for November shipment. Undertone of the export market is stronger, the price being 16.00c, f.a.s. Gulf ports.

Tin — Following advances in the London and Singapore markets, Straits tin prices advanced here to a high of around $1.065. Offerings for spot and prompt delivery were scarce, although those for forward delivery were fairly plentiful. Production of refined tin at the Longhorn smelter, Texas City, Tex., increased to 2905 gross tons in September from 2396 tons in August.

Ingot Brass and Bronze

. . . their shipments going up



Magnesium Prices Advance

Dow Chemical Co., Midland, Mich., advanced the price of primary magnesium ingots 2 cents a pound to 24.50c, f.o.b. Freeport, Tex., effective Sept. 30. The price had been increased 1 cent a pound on July 19. The latest advance is attributed by company officials to a further increase in labor costs.

Magnesium sticks and turnings and magnesium alloy ingots were raised 3 cents a pound, while prices of fabricated magnesium products were also boosted. The new prices range from 42.00c to 44.00c on sticks, 30.50c to 32.50c on alloys, and are 52.00c on turnings, all f.o.b. Midland.

Magnesium production at the company's seawater plant in Freeport, Tex., is at capacity, or at an annual rate of 46 million to 47 million pounds a year. This is about double the rate maintained a year ago.

Aluminum Product Prices Up

Reynolds Metals Co., Louisville, advanced aluminum pig and ingot 1.5 cents a pound to 18.00c and 19.00c, respectively, effective Sept. 29. Price action on fabricated products is expected momentarily.

Upward price adjustments in Aluminum Co. of America's fabricated products, effective Sept. 29, averaged 2.5 to 3 cents per pound and involved base prices and extras. There was no single percentage increase throughout the range of fabricated products, as prices for each were adjusted upward to remedy disparities in narrowing profit margins. Of significance was complete revision of factor ranges and applicable prices for extruded products; also establishment of a separate listing of quantity differentials for plate.

Base prices on flat sheets were advanced 2.7 to 3.3 cents per pound; coiled sheets, 2.6 to 3.3 cents; and coiled sheet circles, 3.1 to 5.3 cents. A designated width and length range is now applicable on base prices for flat sheets; extras are included for special widths and diameters. Special lengths are available subject to customer inquiry. No change was made in quantity differentials for sheet products, including mill standard sizes. Coiled roofing sheets were advanced 1.5 cents per pound; corrugated and 5-V crimp roofing sheet was increased at rate of 1.5 cents a pound. Industrial roofing and accessories were advanced as well as Litho sheet prices.

Intermediate products, such as foil stock, reroll coils, reroll slabs, and forging impact extrusion slabs also were advanced. Base price on plain foil was increased 3.5 to 5 cents per pound; extras for embossed, lacquered and protective coated foil were advanced from 1 to 6 cents.

Quantity differentials have been adopted for all alloys of plate and differ between heat-treatable and non heat-treatable alloys. As in sheets, base prices now are applicable to a designated width and length range; extras have been adopted for special widths, lengths and diameters.

Base prices on screw machine stock were advanced 2 to 3.5 cents per pound for rounds; 2.5 to 3 cents on hexagons. Rod, wire and bar prices were increased 2 to 12.5 cents per pound; structural shape prices are up 3.5 to 5.5 cents.

Canadian Lead, Zinc Prices Up

Consolidated Mining & Smelting Co. of Canada Ltd., Montreal, Que., has reduced its lead and zinc prices about 5 per cent. This was necessitated by the federal government's action in freeing the Canadian dollar.

The new price for lead is 16.80c a pound compared with the pre-dollar revaluation price of 17.50c a pound.

Current zinc prices are: Prime western, 18.35c a pound; grade A, 19.10c; special high grade, 19.35c. Prime western was formerly 19.00c a pound and the other two grades were slightly higher.

The company's lead and zinc prices now vary from day to day according to the fluctuation of the Canadian dollar in terms of the United States dollar.

STEEL'S Metal Price Averages for Sept., 1950

(Cents per pound)

Electrolytic Copper, del. Conn.	23.50
Lead, St. Louis	15.60
Prime, Western Zinc, E. St. Louis	17.10
Straits Tin, New York	101.25
Primary Aluminum Ingots, del.	17.68
Antimony, f.o.b. Laredo, Tex.	31.02
Nickel, f.o.b. refinery	48.00
Silver, New York	72.75

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; cake 24.62½c, delivered.

Brass Ingot: 85-5-5-5 (No. 115) 25.50c; 88-10-2 (No. 215) 37.00c; 80-10-10 (No. 305) 29.50c; No. 1 yellow (No. 405) 21.75c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.60c, delivered.

Lead: Common 15.80c; chemical 15.90c; corroding 15.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 27.25-28.00c; No. 12 foundry alloy (No. 2 grade) 26.75-27.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 28.00-28.50c; grade 2 27.00-27.50c; grade 3, 26.50-27.00c; grade 4, 26.00-26.50c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 106.00c Oct., 105.50c; Nov., 105.25c Dec.-Jan., 105.00c.

Antimony: American 99-99.8% and over but not meeting specifications below 32.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 32.50c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%; Chinese nom.; English, 32.00c; Belgian, 32.00c, duty paid, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York $87-$93 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $30.00 per lb contained Be, f.o.b., Cleveland and Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.40 del.; special or patented shapes, $2.55.

Cobalt: 97-99%, $1.80 per lb for 500 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 72.75c per oz.

Platinum: $100-103 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $220 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 40.93; yellow brass 37.53; commercial bronze, 95% 40.86; 90% 40.38; red brass, 85% 39.39; 80% 38.92; best quality, 38.40; nickel silver, 18%, 51.16; phosphor-bronze, grade A, 5% 59.45.

Rods: Copper, hot-rolled 36.78; cold-drawn 38.03; yellow brass free cutting, 31.88; commercial bronze, 95% 40.55; 90% 40.07; red brass 85% 39.08; 80% 38.61.

Seamless Tubing: Copper 40.97; yellow brass 40.54; commercial bronze 90% 43.04; red brass 85% 42.30; 80% 41.83.

Wire: Yellow brass 37.82; commercial bronze, 95% 39.72; 90% 40.67; red brass, 85% 39.68; 80% 39.21; best quality brass 38.69.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67, l.c.l. 29.17, 100,000 lb lots 28.545; weatherproof, f.o.b. eastern mills, c.l. 29.60, l.c.l. 30.10, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circles† Base
0.249-0.136	12-48	30.1	....	....
0.135-0.096	12-48	30.6	....	....
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.5	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	Round— R317-T4,	Round— 178-T4	Hexagonal— R317-T4	Hexagonal— 178-T4
0.125	52.0	....	....	....
0.156-0.188	44.0	....	....	....
0.219-0.313	41.5	....	....	....
0.375	40.0	46.0	48.0	....
0.406	40.0	....	....	....
0.438	40.0	46.0	48.0	....
0.469	40.0	....	....	....
0.500	40.0	46.0	48.0	....
0.531	40.0	....	....	....
0.563	40.0	....	45.0	....
0.594	40.0	....	....	....
0.625	40.0	43.5	45.0	....
0.688	40.0	....	45.0	....
0.750-1.000	39.0	41.0	42.5	....
1.063	39.0	....	41.0	....
1.125-1.500	37.5	39.5	41.0	....
1.563	37.0	....	....	....
1.625	36.5	....	39.5	....
1.688-2.000	36.5	....	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $21.00 per cwt; add 50c cwt, 10 sq ft to 140 sq ft. Pipe: Full coils $21.00 per cwt. Traps and bends: List prices plus 60%

ZINC

Sheets, 23.50-23.75c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 22.50-23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 21.50-22.00c; over 12-in., 22.50-23.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 77.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b mill)

Sheets, cold-rolled 53.00c. Strip cold-rolled 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb. 55.00-62.00c; 25 to 99 lb. 45.00-52.00c; 100 lb to 5000 lb. 41.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carlonds, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 37.50c; oval 37.00c; cast 35.62c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 55.6c, under 1000 lb 57.6c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,000 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 19.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 65.00c; 10,000 to 30,000 lb, 63.00c; 3000 to 10,000 lb, 67.00c, 500 to 3000 lb, 68.00c; 100 to 500 lb, 70.00c; under 100 lb, 73.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 33.50c; 400-lb bbl 31.50c up to 10,000 lb, 31.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.875
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 21.75; No. 2 copper 20.75; light copper 19.75; composition red brass 19.00; radiators 15.50; heavy yellow brass 14.75.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.75; No. 2 copper 20.75; light copper 19.75; refinery brass (60% copper) per dry copper content 20.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 21.00-21.50; No. 2 19.50-20.00; light copper 18.50-19.00; No. 1 composition red brass 16.75-17.00; No. 1 composition turnings 16.25-16.50; mixed brass turnings 11.00-11.50; new brass clippings 17.00-17.50; No. 1 brass rod turnings 15.50-16.00; light brass 10.50-10.75; heavy yellow brass 13.00; new brass rod ends 16.00-16.50; auto radiators, unsweated 13.75-14.00; cocks and faucets, 15.75-16.00; brass pipe 15.75-16.00.

Lead: Heavy 13.25-13.50; battery plates 8.25-8.50; linotype and stereotype 14.50-14.75; electrotype 12.75-13.00; mixed babbitt 12.25-12.50.

Zinc: Old zinc 11.00-11.25; new die cast scrap 10.75-11.00; old die cast scrap 8.00-8.25.

Tin: No. 1 pewter 55.00-57.00; block tin pipe 75.00-77.00; No. 1 babbitt 50.00-52.00.

Aluminum: Clippings 2S 15.00; old sheets 13.00; crankcase 13.00; borings and turnings 12.00.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Oct. 4-5	24.50	15.80	17.50	106.00	19.00	32.00	48.00	72.75
Oct. 3	24.50	15.80	17.50	105.75	19.00	32.00	48.00	72.75
Oct. 2	24.50	15.80	17.50	104.00	17.50-19.00	32.00	48.00	72.75
Sept. Avg.	23.50	15.60	17.10	101.25	17.68	31.02	48.00	72.75
Sept. 28-30	22.50-24.50	15.80	17.50	102.50	17.50-19.00	32.00	48.00	72.75
Sept. 27	22.50-24.50	15.80	17.50	103.50	17.50-19.00	32.00	48.00	72.75
Sept. 25-26	22.50-24.50	15.80	17.50	104.00	17.50-19.00	32.00	48.00	72.75
Sept. 22-23	22.50-24.50	15.80	17.50	103.50	17.50	32.00	48.00	72.75
Sept. 21	22.50-24.50	15.80	17.50	103.00	17.50	32.00	48.00	72.75
Sept. 20	22.50-24.50	15.80	17.50	102.50	17.50	32.00	48.00	72.75
Sept. 18-19	22.50-24.50	15.80	17.50	101.00	17.50	32.00	48.00	72.75
Sept. 14-16	22.50-24.50	15.80	17.50	103.00	17.50	32.00	48.00	72.75
Sept. 13	22.50-24.50	15.80	17.50	102.00	17.50	32.00	48.00	72.75
Sept. 12	22.50-24.50	15.80	17.50	101.25	17.50	32.00	48.00	72.75
Sept. 11	22.50-24.50	15.80	17.50	100.50	17.50	32.00	48.00	72.75
Sept. 8-9	22.50-24.50	15.80	17.50	99.00	17.50	28.50	48.00	72.75
Sept. 7	22.50-24.50	14.80	17.50	99.00	17.50	28.50	48.00	72.75
Sept. 6	22.50-24.50	14.80	15.00	97.50	17.50	28.50	48.00	72.75
Sept. 5	22.50-24.50	14.80	15.00	95.50	17.50	28.50	48.00	72.75
Sept. 1-2	22.50-24.50	14.80	15.00	97.50	17.50	28.50	48.00	72.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Oct. 5, 1950; gross tons
Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Oct. 5	$41.00
Sept. 28	41.00
Sept. 1950	40.93
Oct. 1949	26.71
Oct. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$44.00
No. 2 Heavy Melt.	41.00
No. 1 Busheling	44.00
No. 1 Bundles	*44.00-46.00*
No. 2 Bundles	39.00
Heavy Turnings	43.00-44.00
Machine Shop Turnings	*35.00-35.50†*
Mixed Borings, Turnings	*35.00-35.50†*
Short Shovel Turnings	38.00
Cast Iron Borings	35.50-36.00
Low Phos. Steel	*49.00-50.00*

Cast Iron Grades

No. 1 Cupola Cast	*47.50-48.50*
No. 1 Machinery Cast	*52.00-53.00*
Charging Box Cast	*44.50-45.00*
Heavy Breakable Cast	*43.00-44.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
Rails, Random Lengths	*55.00-56.00*
Rails, 2 ft. and under	*57.00-58.00*
Rails, 18 in. and under	*58.00-59.00*
Railroad Specialties	*56.00-57.00*

† Crushers' buying prices.
* Nominal.

CLEVELAND

(Delivered Consuming Plant)

No. 1 Heavy Melt. Steel	*$42.50-43.00*
No. 2 Heavy Melt. Steel	*39.00-39.50*
No. 1 Busheling	*42.50-43.00*
No. 1 Bundles	*42.50-43.00*
No. 2 Bundles	*31.00-31.50*
Machine Shop Turnings	*35.00-35.50*
Mixed Borings, Turnings	*36.50-37.00*
Short Shovel Turnings	*36.50-37.00*
Cast Iron Borings	*36.50-37.00*
Low Phos.	*46.00-46.50*

Cast Iron Grades

No. 1 Cupola	52.00-53.00
Charging Box Cast	46.00-47.00
Stove Plate	44.00-45.00
Heavy Breakable Cast	43.00-44.00
Unstripped Motor Blocks	36.00-37.00
Brake Shoes	40.00-41.00
Clean Auto Cast	54.00-55.00
No. 1 Wheels	46.00-47.00
Burnt Cast	41.00-42.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00
R.R. Malleable	60.00-62.00
Rails, 3 ft and under	61.00-63.00
Rails, 18 in. and under	63.00-64.00
Rails, Random Lengths	56.00-58.00
Cast Steel	48.00-49.00
Railroad Specialties	49.00-50.00
Uncut Tires	54.00-56.00
Angles, Splice Bars	57.00-59.00

VALLEY

No. 1 Heavy Melt. Steel	**$43.50-44.00**
No. 2 Heavy Melt. Steel	**39.50-40.00**
No. 1 Bundles	**43.50-44.00**
Facty. Prod. Bundles	**43.50-44.00**
No. 2 Bundles	**34.00-34.50**
Machine Shop Turnings	*35.00-35.50*
Short Shovel Turnings	*37.00-37.50*
Cast Iron Borings	*37.00-37.50*
Low Phos.	46.00-46.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	**43.50-44.00**

PHILADELPHIA

No. 1 Heavy Melt. Steel	$39.00
No. 2 Heavy Melt. Steel	36.00
No. 1 Busheling	38.00
No. 1 Bundles	39.00
No. 2 Bundles	32.00
Short Shovel Turnings	33.00
Machine Shop Turnings	*28.50-29.00*
Mixed Borings, Turnings	27.00
Low Phos. Punchings and Plate, elec. fur. grade	*47.00*
Low Phos. Plate, 5 ft & Under	*47.00*
Elec. Furnace Bundles	*44.00*
Heavy Turnings	39.00
No. 1 Chemical Borings	39.00
Knuckles and couplers	*48.00*
Steel car wheels	*48.00*

Cast Iron Grades

No. 1 Cupola Cast	*46.00-47.00*
No. 1 Machinery Cast	*49.00-51.00*
No. 1 Yard Cast	*44.00-45.00*
Charging Box Cast	*44.00*
Heavy Breakable Cast	*44.00*
No. 1 Wheels	*52.00*
Malleable	*58.00-59.00*

*

CINCINNATI

No. 1 Heavy Melt. Steel	*$43.00*
No. 2 Heavy Melt. Steel	*38.00*
No. 1 Busheling	*43.00*
No. 1 Bundles	*43.00*
No. 1 Black Bundles	*38.00*
No. 3 Bundles	*28.00*
Machine Shop Turnings	*27.00*
Short Shovel Turnings	*30.00*
Mixed Borings, Turnings	*29.00*
Cast Iron Borings	*30.00*

Cast Iron Grades

No. 1 Cupola Cast	55.00
Charging Box Cast	48.00
Stove Plate	*40.00*
Heavy Breakable Cast	*47.00*
Unstripped Motor Blocks	34.00
Brake Shoes	*33.00*
Clean Auto Cast	55.00
Drop Broken Cast	57.50
Low Phos., 18 in. and under	53.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00
R.R. Malleable	55.00
Rails, Rerolling	55.00
Rails, Random Lengths	54.00
Rails, 18 in. and under	*63.00*

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$30.00-31.00
No. 1 Bundles	37.00-37.50
No. 2 Bundles	29.00-30.00
No. 1 Busheling	37.00-37.50
Machine Shop Turnings	25.00-25.50
Forge Flashings	37.00-37.50
Short Shovel Turnings	27.00-27.50
Cast Iron Borings	27.00-27.50
Punchings & Plate Scrap	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	**42.00-43.00**
Heavy Breakable Cast	**35.00-36.00**
Clean Auto Cast	**45.00-46.00**

BUFFALO

No. 1 Heavy Melt. Steel	$41.00-42.00
No. 2 Heavy Melt. Steel	38.00-38.50
No. 1 Busheling	38.00-38.50
No. 1 Bundles	39.50-40.00
No. 2 Bundles	36.00-36.50
Machine Shop Turnings	*31.50-32.00*
Mixed Borings, Turnings	*31.50-32.00*
Cast Iron Borings	*31.50-32.00*
Short Shovelings	*33.50-34.00*
Low Phos.	42.00-43.00

Cast Iron Grades

No. 1 Cupola	*44.00-45.00*
No. 1 Machinery	*48.00-50.00*
Malleable	*49.00-50.00*

Railroad Scrap

Rails, 2 ft. and under.	49.00-50.00
Rails, random size	44.00-45.00
Railroad Specialties	42.00-43.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$34.50
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	32.00-33.00
No. 1 Bundles	34.50
No. 2 Bundles	27.00-28.00
Machine Shop Turnings	*23.50-24.50*
Mixed Borings, Turnings	23.00-24.00
Short Shovel Turnings	*26.00-27.00*
Punchings & Plate Scrap	36.00-37.00
Low Phos. Plate, 5 ft & under	36.00-37.00
Elec. Furnace Bundles	*36.00-37.00*

Cast Iron Grades

No. 1 Cupola Cast	*35.00-36.00*
No. 1 Machinery	*37.00-38.00*
Charging Box Cast	*35.00-36.00*
Heavy Breakable	*35.00-36.00*
Unstripped Motor Blocks	29.00-30.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	**$32.00**
No. 2 Heavy Melt. Steel	*27.50-28.00*
No. 1 Bundles	**32.00**
No. 1 Busheling	*31.00-31.50*
Machine Shop Turnings	**23.00-23.50**
Short Shovel Turnings	*25.00-25.50*
Mixed Borings, Turnings	*25.00-25.50*
Bar Crops and Plate	*40.00-42.00*
Punchings & Plate Scrap	*40.00-42.00*
Chemical Borings	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	*33.50-34.50*
Mixed Cast	*32.50-33.50*
Heavy Breakable Cast	*30.00-32.00*
Stove Plate	*32.00-32.50*

CHICAGO

No. 1 Heavy Melt. Steel	**$40.00**
No. 2 Heavy Melt. Steel	**38.00**
No. 1 Bundles	**40.00**
No. 2 Bundles	**34.00-35.00**
Machine Shop Turnings	31.00-32.00
Mixed Borings, Turnings	*33.00-34.00*
Short Shovel Turnings	*33.00-34.00*
Cast Iron Borings	*33.00-34.00*
Low Phos.	*49.00-50.00*
Elec. Furnace Bundles	**40.00-41.00**
Heavy Turnings	**37.00-38.00**
Cut Structurals	**44.00-45.00**

Cast Iron Grades

No. 1 Cupola Cast	50.00-51.00
Clean Auto Cast	50.00-51.00
No. 1 Wheels	39.00-40.00
Stove Plate	39.00-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	**40.00***
Malleable	56.00-57.00
Rails, Rerolling	60.00-62.00
Rails, Random Lengths	**54.00-55.00**
Rails, 2 ft and under	**59.00-60.00**
Rails, 18 in. and under	**60.00-61.00**
Railroad Specialties	**49.00-50.00**
Angles, Splice Bars	**53.00-54.00**

* Nominal.

BIRMINGHAM

No. 1 Heavy Melt. Steel	**$34.50-35.50**
No. 2 Heavy Melt. Steel	31.00-32.00
No. 1 Busheling	31.00-32.00
No. 2 Bundles	29.00-30.00
Machine Shop Turnings	**27.00-28.00**
Mixed Borings, Turnings	**23.00-24.00**
Short Shovel Turnings	**27.00-28.00**
Cast Iron Borings	**27.00-28.00**
Bar Crops and Plate	**41.00-42.00**
Cut Structurals	**41.00-42.00**

Cast Iron Grades

No. 1 Cupola Cast	51.00-52.00
Stove Plate	46.50-47.50
No. 1 Wheels	**37.00-38.00**

Railroad Scrap

No. 1 R.R. Heavy Melt.	**40.00-41.00**
R.R. Malleable	**nominal**
Rails, Rerolling	**48.00-49.00**
Rails, 3 ft and under	**48.00-49.00**
Angles and Spice Bars	**47.00-48.00**

ST. LOUIS

No. 1 Heavy Melt. Steel	$39.00-40.00
No. 2 Heavy Melt. Steel	36.00-37.00
No. 1 Bundles	39.00-40.00
No. 2 Bundles	34.00-35.00
Machine Shop Turnings	27.00-28.00
Short Shovel Turnings	30.00-31.00

Cast Iron Grades

No. 1 Cupola Cast	47.00-48.00
Charging Box Cast	39.00-40.00
Heavy Breakable Cast	40.00-42.00
Brake Shoes	44.00-45.00
Clean Auto Cast	46.00-48.00
Burnt Cast	38.00-39.00

Railroad Scrap

R.R. Malleable	55.00-57.00
Rails, Rerolling	**57.00-58.00**
Rails, Random Lengths	**51.00-53.00**
Rails, 2 ft and under	**56.00-58.00**
Uncut Tires	46.50-47.50
Angles, Splice Bars	55.00-56.00
Railroad Specialties	**49.00-50.00**

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$26.50*
No. 2 Heavy Melt. Steel	*24.50*
No. 1 Bundles	26.50
No. 2 Bundles	*22.50*
No. 3 Bundles	19.50
Machine Shop Turnings	13.00
Low phos, electric	40.00

Cast Iron Grades

No. 1 Cupola Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	*26.50*
Rails, Random Lengths	*26.50*

SEATTLE

No. 1 Heavy Melt. Steel	$24.00
No. 2 Heavy Melt. Steel	24.00
No. 1 Busheling	21.50
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	18.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Punchings & Plate Scrap	30.00-32.50
Cut Structurals	30.00-32.50

Cast Iron Grades

No. 1 Cupola Cast	30.00-35.00
Heavy Breakable Cast	30.00
Stove Plate	25.00-27.50
Unstripped Motor Blocks	30.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	35.00
No. 1 Wheels	32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	25.00
Railroad Malleable	30.00
Rails, Random Lengths	26.00
Angles and Splice Bars	25.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$26.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	17.50
Machine Shop Turnings	12.00
Punchings & Plate Scrap	35.50

Cast Iron Grades

No. 1 Cupola Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	37.50
Rails, Rerolling	39.50

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
Mixed Borings, Turnings	23.00
Rails, Remelting	30.00
Rails, Rerolling	33.00
Busheling	24.50
Bushelings new factory, prep'd	28.00
Bushelings new factory, unprep'd	23.00
Short Steel Turnings	23.00

Cast Iron Grades*

No. 1 Machinery Cast	*45.00*

* F.o.b. shipping point.

Sheets, Strip . . .

Sheet and Strip Prices, Page 119 & 120

New York—While it is too early for the NPA priority system to take effect, sheet sellers believe that within another two weeks they will be confronted with a number of DO priorities which will further tighten deliveries. Actually the Defense Department has until Oct. 18 to decide what orders will receive this rating and it appears doubtful if many orders carrying this priority designation will be issued before then. Should that be the case it would be difficult, even allowing for a shortening in the lead time, to get much tonnage scheduled before late November or early December. Some believe that in point of actual volume priority orders may not run heavy until well in the first quarter.

Sellers have been receiving an increasing amount of emergency work in the nature of railroad car tonnage, storage bin specifications, etc. This type of business will be little disturbed by DO priorities.

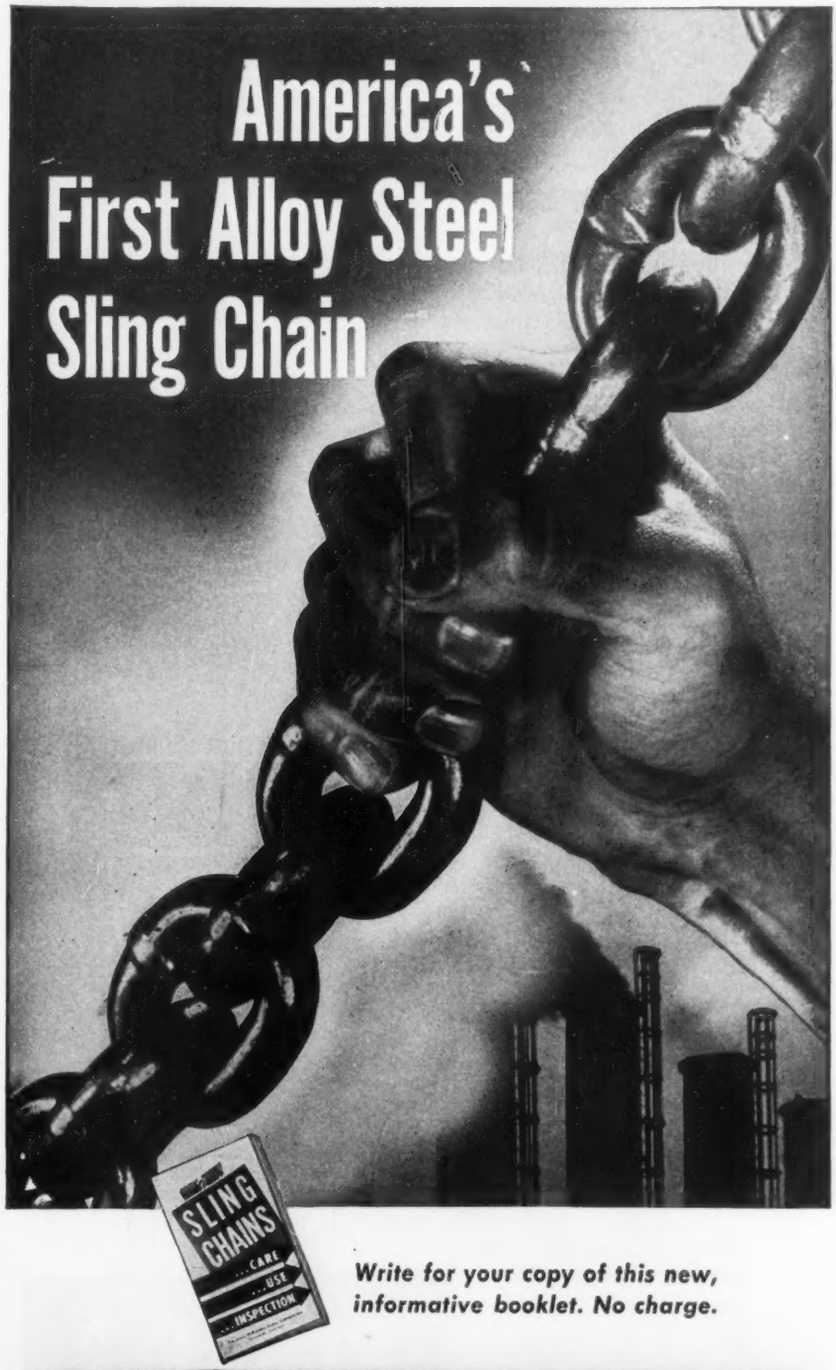
The new regulation, with its single priority, is regarded as adequate for the moment. However, there are points that stand in need of clarification. One criticism is that apparently a manufacturer with a DO rating can approach any steel producer with the expectation of getting desired tonnage, provided his request is in accordance with the provisions of the regulation. There is no suggestion that manufacturers must first approach regular sources of supply. It is believed that there will be a strong temptation for buyers to go to other than regular sources so as not to interfere with production of their own commercial work already on order. Many producers are not satisfied on this score, especially as there appears to be no limitation as to how much priority tonnage each mill may be obligated to accept.

Another point under discussion is the clause permitting the Defense Department to issue special directives and authorizations that could readily set up a multiple rating system which in no time at all might result in widespread confusion.

Boston—Kiting of steel requirements cloaked under armament contracts is disclosed through strict policing of distribution in scattered cases. Such cases are new, but one covered 100 tons where less than one tenth that volume was needed to meet a minor defense order. Confusion is building up ahead of NPA priority administration. Urgency of DO orders, lead time for various products and price factor, involving nearest mill with lowest steel cost to holders of priority paper, call for clarification. While price is minor factor in civilian demand in pressure for sheets and strip, consumers with priorities employ this rating in attempt to place steel at lowest delivered cost.

Pittsburgh—Upward price adjustments in sheets and strip were effected by the following companies. Sharon Steel, on Sept. 30, raised hot-rolled strip, $5 per ton; cold-rolled alloy strip, $12; cold-rolled carbon strip, hot-rolled alloy strip and cold-finished spring steel, $7 per ton. Niles Rolling Mill, effective Sept. 30, advanced long ternes, enameling sheets and hot-rolled sheets, $10 per ton;

CM HERC-ALLOY



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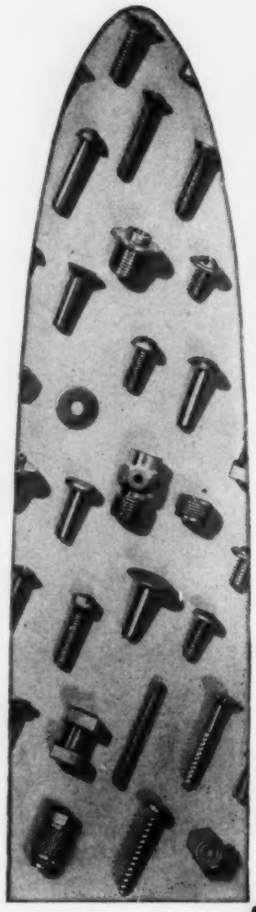

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silicon steels, $6. Follansbee Steel, on Oct. 3rd, increased cold-rolled strip and blued sheets $7 per ton.

Philadelphia—While most sellers of stainless sheets have accepted orders for first quarter, they recently have restricted action considerably, due to the scarcity of nickel. Some, in fact, are taking little or no business. Sellers of other grades of sheets are out of the market except in the case of emergency tonnage, which in most cases is pushing commercial commitments into next year.

Cleveland — Military priorities are expected to begin cutting severely into civilian supplies of sheets and strip within the next month. While producers have been giving preference to such tonnage right along, the fact that tonnage was not specifically allocated to the individual makers served to provide some leeway for a seller to decline bookings. Under government allocation, however, this is not possible, since each producer will be committed to provide his share of any required emergency tonnage. This means that November and December rolling schedules, which already have been set up, will be disrupted. Civilian consumer quotas for those two months, therefore, mean little from a practical standpoint.

Cincinnati—Sheet supply is tighter as customers press for tonnages. Mills are giving priority to military needs. Quotas for civilian requirements in fourth quarter schedules are reduced. Schedules are being set up month by month, instead of quarterly. Inquiries for stainless have increased sharply.

Chicago—Gray market sheets appear the salvation of an increasing number of consumers. Price of cold-rolled is hovering around $350 a ton. Successful tracing by one mill of gray market sheets to a manufacturer resulted in cancellation of his allocation. All mills are policing customers with the intention of shutting off future shipments if irregular disposal of surplus develops. There are no indications NPA's "DO" rating will lessen the plight of sheet consumers. Military orders have been accorded priority and except where excessive cross-hauling is involved mills here have accepted all orders in proportion to their share of industry capacity

Production at Carnegie-Illinois' Gary sheet and tin mill returned to normal last Monday after union officials said slowdowns, which had caused the company to lay off 1300 men, were unauthorized.

St. Louis—Imbalance between supply demand in cold-rolled sheets gets worse weekly. Consumers are jockeying for schedule position in unprecedented fashion, consumers attempting to buy ingots, and others without conversion material trying to buy conversion rolling time. Gray market activity is flourishing with cold sheets quoted at 15 to 18 cents a pound. Sheet schedules here are filled through fourth quarter, with some space reserved in an attempt to get current by Jan. 1.

Los Angeles—Uncertain deliveries, coupled with dwindling supplies of strip turn more cold-rolled strip finishing facilities to conversion. Half of California Cold Rolled Steel Corp.'s bookings are conversion tonnage.

Granite City Ups Prices

Granite City, Ill. — Granite City Steel Co. effected an across the board increase of $10 a ton on all products shipped after Sept. 27, advances ranging from 11 to 14 per cent.

Granite City Steel's newly posted prices, per hundredweight, f.o.b. Granite City, plus extras, are: Cold-rolled sheets $4.80, porcelain enameling sheets $5.10, hot-rolled sheets $4.05, carbon steel plates $4.20, galvanized corrugated steel $5.10 and electrical sheets $7.40.

Steel Bars . . .

Bar Prices, Page 119

Cleveland—Civilian consumers will find the going increasingly rough from here on when it comes to obtaining bar supplies. The mills are loaded with tonnage, entering fourth quarter with large carryover. Now that military allocations are in immediate prospect under government direction indications are fourth quarter quotas to civilian uses will be further cut. Expectations are the carryover from fourth quarter into first quarter of next year will be still heavier than the overflow from the third quarter.

Boston — Consumers with defense contracts are confronted with no serious problem in procurement, but producers of civilian goods with little or no inventory are becoming squeezed. With capacity sold through December, every ton taken for defense is at expense of general distribution. Including alloys, armament orders account for better than 30 per cent of current bar volume.

New York—Except for cold drawn, bar sellers have not yet accepted tonnage for delivery beyond end of this year. With an increasing amount of emergency tonnage in early prospect it appears no little commercial tonnage now on order for shipment this quarter will be carried over into next year.

Philadelphia—Increasing amount of emergency bar tonnage is forcing more commercial work into next year. Sellers of hot carbon bars have not opened books for first quarter, but under the circumstances have commitments for that period just the same, due to the carryover which will be necessary.

Pittsburgh—Shortage of hot-rolled bars has prevented coldfinishers from adding a third production shift to meet substantially increased demand. Expanding direct and indirect military needs are being met only at expense of shipments for less essential end uses. Coldfinishers soon may adjust prices upward due to narrowing profit margins.

Chicago—Forgers are up against it for steel for civilian requirements and one here is putting in electric furnace capacity. Steel for military forgings is being obtained but with such orders apparently due for substantial increase quotas of non-defense forging ingots and billets will necessarily be reduced. Carbon and alloy bar requirements remain in excess of mills' capacity and cold-drawers' operations are held to less than rated capacity by restricted supply of hot bars.

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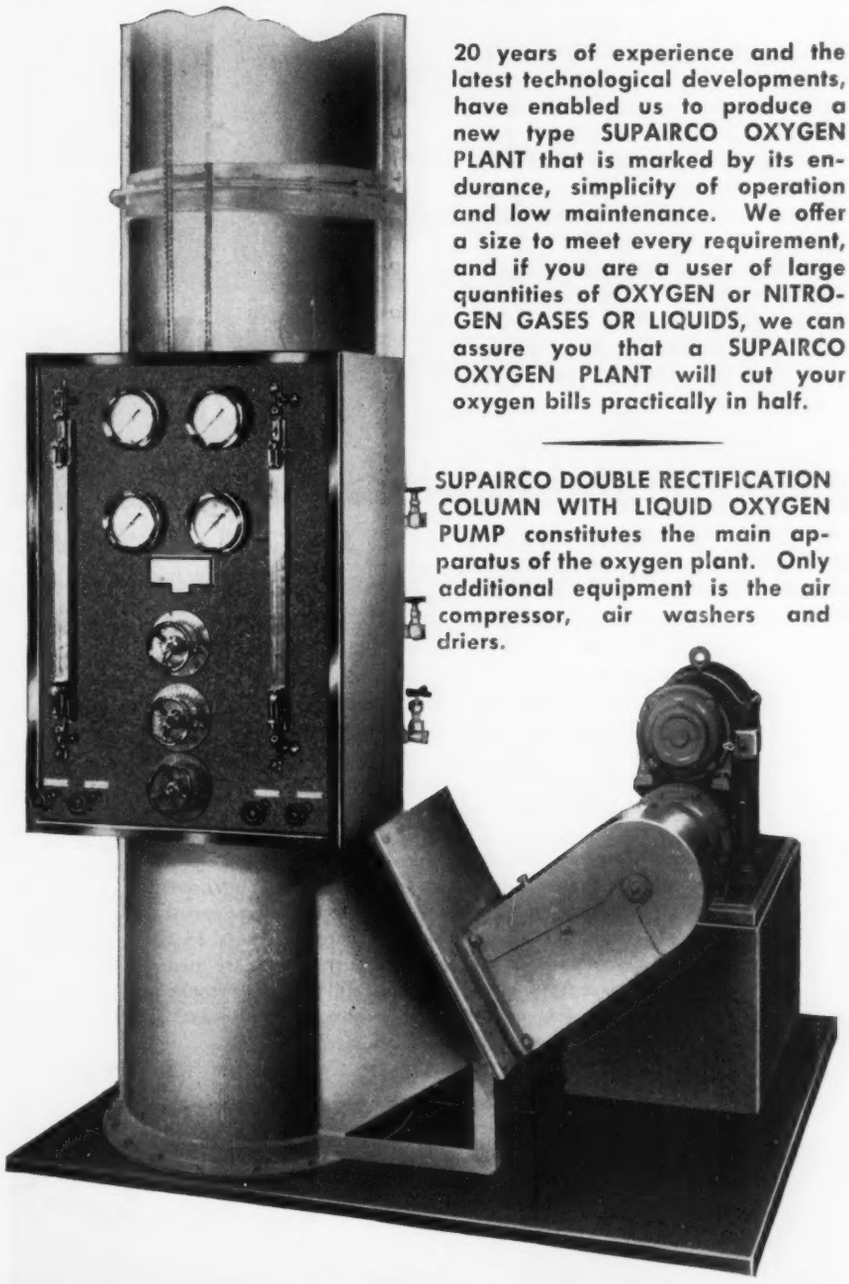

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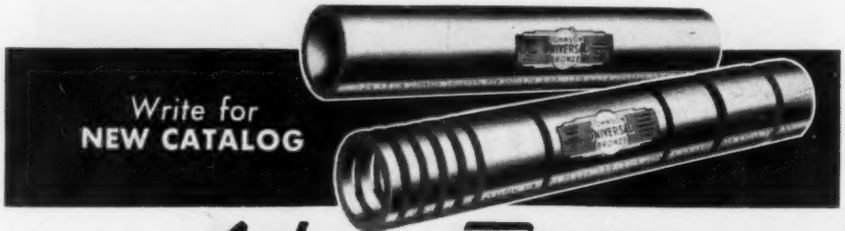

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Tin Plate . . .

Tin Plate Prices, Page 120

Pittsburgh—Demand for tin plate is so great there likely will be no significant change in consumer preference as to grades this quarter. Military needs scheduled for delivery over closing months this year are relatively small. More widespread use of electrolytic tinning process has lessened need for a tin conservation order. Availability of cold-reduced coils for tinning will be of more immediate concern should military requirements be substantially increased.

Los Angeles—Kaiser Steel Corp. will add a tin plate mill of 200,000 tons annual capacity to its Fontana facilities. The additional facilities will help meet the West's food canning industry tin plate requirements, estimated at 700,000 tons per year.

Tubular Goods . . .

Tubular Goods Prices, Page 122

Pittsburgh—Jones & Laughlin advanced lapweld and seamless galvanized pipe $5 per ton effective Oct. 4; on same date galvanized buttweld pipe was increased as follows: ½-in., $5; ¾-in., $7; 1-in., $8; 1¼ through 2-in., $7; 2½ and 3-in., $6.

Company also established price bands (range) on tubular products related to price of zinc, beginning at 10 cents for zinc. Each band represents an advance of one cent on zinc prices equivalent to one point or $2 per ton for sizes ½, ¾ and 1-in.; ¾-point on 1¼, 1½ and 2-in.; and ½ point for over 2-in.

Prices will be based on zinc quotation, East St. Louis, as published at the close of each week. This will minimize frequent price adjustments in a sharply fluctuating zinc market.

Mercer Tube Co. advanced galvanized buttweld pipe prices $5 per ton or 2½ points lower discount, effective Sept. 22.

A. M. Byers advanced wrought iron galvanized pipe $5 per ton, effective Oct. 2.

Pittsburgh Steel Co. increased oil country tubular goods, effective Oct. 3, as follows: casing, equivalent of $7 per net ton; tubing, $5; and drill pipe, $10 per net ton. Tubing specialties were advanced as follows: Schedule A, multiple list prices by factor 1.19; schedule D, by 1.18; schedule H, increased $5 per net ton on base prices; schedule F, discounts were lowered by 2½ points.

Boston—Allocations of merchant steel pipe for November approximate October volume which was reduced approximately 50 per cent by some producers. Orders for better than 500,000 feet, cold-drawn steel tubing have been placed with Union Hardware Co., Torrington, Conn., and Ellwood Ivins Steel Tube Co., Philadelphia, at 9.76c and 11.97c per foot respectively, Springfield, Mass. armory.

Chicago—Though operating at capacity, integrated tubular goods producers are unable to work down arrearages. Deliveries in some cases have been moved back 45-60 days. Non-integrated mills experience serious difficulty obtaining tube rounds and skelp. Jobbers' stocks are depleted.

Tool Steel . . .

Tool Steel Prices, Page 121

Pittsburgh — Higher tool steel prices appear in the offing to offset increased raw material costs. Demand has improved since mid-summer with some interests 10 to 12 weeks behind on deliveries. Growing shortage of nickel has forced sellers to be more selective in order acceptance from stainless high speed steel users.

Plates . . .

Plate Prices, Page 119

New York—Some plate tonnage is being booked for first quarter. However, leading producers have not opened their books for the period, where they have accepted business it being of general emergency character, such as car steel, combat tank work, etc. It appears likely, with the Defense Department focusing attention on tonnage that may be had under the new priority regulations, that there will be an early increase in preference work which will noticeably affect rolling schedules late in the current quarter, forcing a substantial amount of commercial business scheduled for shipment this year into the first quarter of next year. To meet this increasing stringency, more sheet and strip capacity is scheduled to be converted to plates. The tremendous increase in car requirements is stepping up pressure for emergency tonnage and there are now prospects of a substantial increase in ship work. Except for some seasonal decline in underground fuel storage tanks, tank demand continues strong. There is special pressure for field oil storage tanks.

Boston—An Ohio producer is converting some sheet-strip capacity to rolling of light plates and established an extra list in line with others in that district. At least one eastern mill is also producing plates on strip equipment. This has little effect on shortage of light plates as yet and tank builders are especially pinched by need of plates to maintain operations. Flange departments are heavily booked; spun head deliveries approximate those of plates with pressed heads extended 22 to 24 weeks.

Philadelphia—While there has been little or no DO priority tonnage to date, most plate producers indicate they will not accept such business from other than their regular customers, pending further clarification on the question from Washington. Some light may come soon in a governmental order fixing a maximum percentage of output that a producer may be compelled to devote to defense production. As no intention is indicated by expanding authority for issuing DO priorities beyond the armed forces and the Atomic Energy Commission, attention has been increasingly focused on the setting up of a voluntary allocation program covering such emergency requirements as freight cars, grain bins and so forth. Meetings in Washington last week furthered plans which should reach fulfillment within a few weeks. Meanwhile, producers are giving this type of work the green light.

Cleveland — Requirements of the

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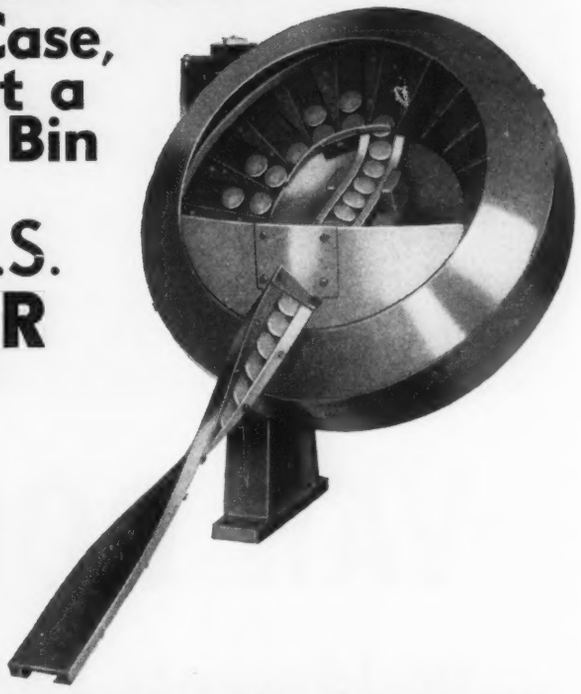

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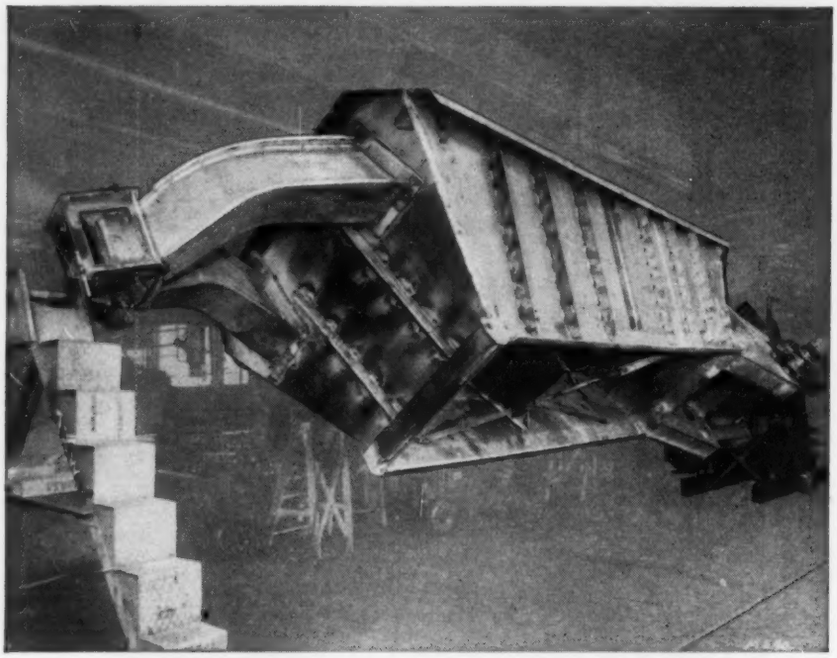

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railroads and petroleum industry will cut sharply into available supplies of plates and heavy sheets over coming months. Indications are civilian consumers will have to scratch for supplies unless they are able to get a military priority, and even then tonnage for such will likely come out of the buyer's regular civilian quota. It is estimated that railroad and oil industry needs of plates and sheets will run around 263,000 tons monthly. This tonnage will be divided among the various producers on the basis of their percentage of industry capacity. And it means that considerable sheet tonnage will be lost through conversion of some strip mills to production of plates.

Chicago—Lake freighter repairs this winter will drain off some of the not-yet-allocated plate tonnage. Mills are hesitant to tell general consumers what their allocations will be, but those who are putting freight car building second only to military orders indicate other users will have slim pickings over next three months.

Los Angeles—Some fabricators receive only one-half of plate tonnage needs from mills. Kaiser Steel Corp.'s new 86-in. hot-strip mill is rolling ⅜ in. and ¼ in. plate to help satisfy demand.

Wire . . .

Wire Prices, Page 121

Chicago—Wire items requiring zinc have been advanced by two nearby producers and indications are others will soon follow. Northwestern Steel & Wire Co., effective Oct. 2, advanced galvanized merchant wire $5 per ton to 5.85c, Chicago base. Galvanized manufacturers wire is also up $5 a ton, while galvanized fence staples and poultry fence are up 5 columns. Galvanized barbed wire was increased 7 columns. Extras for galvanized nails had been increased $14 per ton, effective Sept. 19. Keystone Steel & Wire Co. on Oct. 4 increased galvanized barbed wire $5 per ton.

Pittsburgh—Jones & Laughlin advanced following prices $4 per ton effective Oct. 4: Galvanized nails and staples to column 110; galvanized barbed wire, column 130; galvanized field (woven) fence, column 120; merchant quality galvanized wire to $5.80 per 100 pounds; galvanized stone wire to $11.50 per 100 pounds; and regular galvanized wire to $5.55. Galvanized nail extras were increased $14 per ton or 70 cents on per 100 pound basis as follows: 15 gage and coarser to $3.15; finer than 15 gage, $3.65.

Company has established a graduated table of price bands (range) on galvanized wire products and extras related to price of zinc as published the last of each week. In case of galvanized nail extras the band begins at 10 cents a pound, and is increased in increments of 5 cents per 100 pounds for each ½-cent per pound advance in zinc price.

For all other wire products, including staples, the bands begin with zinc price at 10 cents per pound up to but not including 12 cents, for each additional 2 cents advance in zinc the price of galvanized wire products is advanced 5 cents per 100 pounds or one column.

Pittsburgh Steel Co. made the fol-

lowing upward price adjustments Oct. 3, on per 100 pound basis: Wire rods, 20 cents; low and medium carbon basic manufacturers wire, flat and rope wire, 25 cents; bright, blued and coated standard nails and galvanized standard nails, 6 columns; nail galvanizing extras, 35 cents; polished fence staples, 6 columns; galvanized fence staples, 13 columns; merchant quality annealed and galvanized wire, 25 cents; farm and poultry fence, 7 columns; lawn fence equivalent to 35 cents; and welded steel fabrics, equivalent to 40 cents.

Boston—More wire products are on allocation with only wire rope and music wire exempt in several cases. Quotas are on monthly basis with lead-time generally on short schedule. Heavier demand for alloys stems largely from aircraft, notably screws and fasteners.

Semifinished Steel . . .

Semifinished Prices, Page 119

Los Angeles—Shortage of semifinished steel, limiting finished product output of Kaiser Steel Corp.'s Fontana mill, will be eased. Additional facilities to provide 180,000 tons of ingots yearly is part of a $40 million expansion program at Fontana.

Structural Shapes . . .

Structural Shape Prices, Page 119

Boston — Fewer structural shops are bidding for larger tonnage contracts, being in doubt as to availability of plain material for long term commitments. But three quoted steel direct, superstructure, channel span, Charles river bridge, Boston. Low unit quotations included: 17.80c pound, 568 tons, carbon steel in flooring system and bracing; 20.33c pound, 240 tons carbon steel in trusses, and 22.32c, silicon steel in trusses, 661 tons, all by American Bridge Co., awarded the contract at $766,222.98, total of 1720 tons involved. Others quoting were Harris Structural Steel Co., New York, and Bethlehem Steel Co.

New York—Private demand for steel construction is catching up on public inquiry. Some of the larger fabricators claim private work is running ahead, due partly to seasonal influences and partly to the fact there is usually less red tape and less delay in financing. As for the overall picture, there appears less demand than a few weeks ago, due not only to the advancing season but to the fact fabricators are booked ahead anywhere from six to seven months. One factor in the extended delivery promises of fabricating shops is their inability to obtain sufficient steel to maintain anticipated operations.

Philadelphia—Fabricating shops are cutting deeply into inventories. Some are out of various sizes entirely. Operations are being affected and some fabricators claim that by turn of year they will be down to 50 per cent of normal. Inquiry is still substantial. Meanwhile, fabricated steel prices are stronger and building costs in general are advancing.

Pittsburgh—Fabricators are booked well into next year due to continued heavy influx of new work and restricted supply of steel. There is more concern with promptness of mill de-

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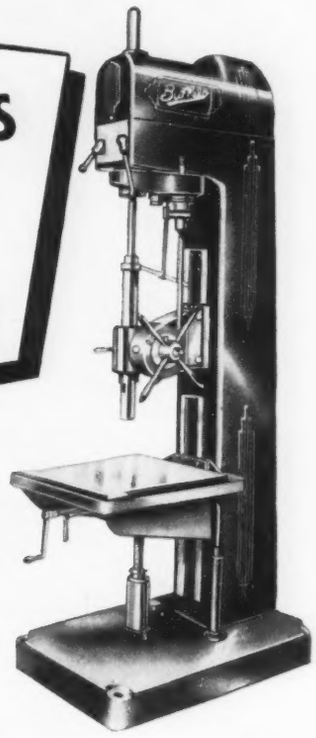

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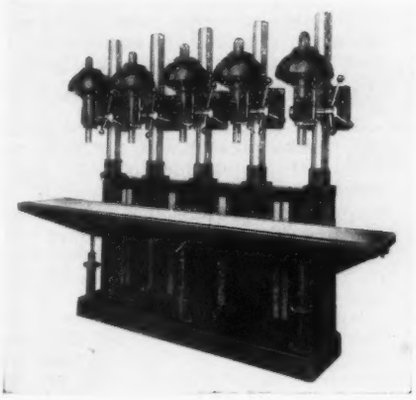

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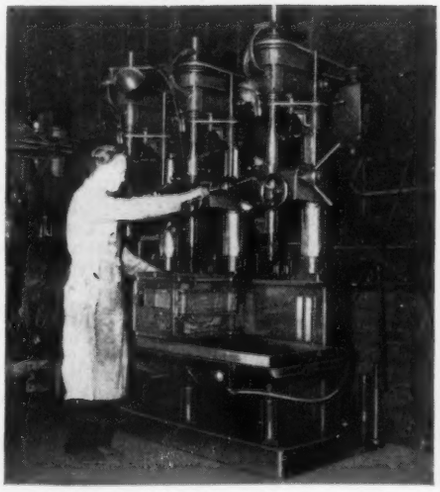

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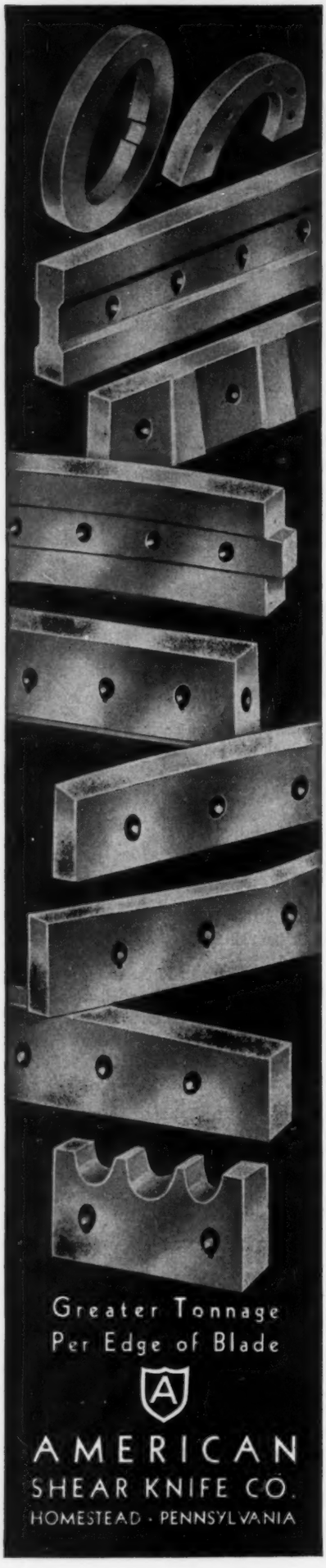

liveries than prices as suppliers indicate prospect of further cut-back in allotments. American Bridge Co. booked 3300 tons for a Meadville, Pa., bridge.

Chicago—Construction of additional steelmaking capacity is adversely affecting the quantity of structurals available to other users. Mills usually replace fabricators' stocks to the extent they are consumed on such projects, and where it is impossible to replace item-for-item, equivalent tonnage of other materials is supplied. Fabricators' order backlogs are heavier, reflecting fear that cutbacks in construction will be inevitable. Mills which have not yet opened December books expect to do so in the next two weeks.

Los Angeles—Superior courthouse project was postponed one year when county officials read bids $5 million higher than the $11 million estimate. Olympic Shopping Circle, planned by Prudential Insurance Co. will cost $20 million.

San Francisco — Supplies of structurals remain tight and users are finding it difficult to get even small orders filled.

To Revise Tin Plate Pricing

Pittsburgh—Carnegie-Illinois Steel Corp. plans to revise base prices and extras Jan. 1 to more accurately reflect modern mill practice in the production, sorting and packaging of tin plate.

Extras for basic weight and specified widths presently do not fully reflect costs applicable to wide, high-speed, cold-reduction mills. It is therefore proposed that a width range of 26 to 28 in. be established as base with applicable extras under that range and deductions for over the base width range.

An increase in deductions from base price also is proposed for basis weight under 100 lbs.; extras for heavier basic weight will be increased.

Elimination of the packaging extra of 10 cents also is proposed to reflect the present practice of multiple packaging holding 10 packages of 112 ft. Formerly tin plate was generally shipped in individual wooden containers of 112 ft. Appropriate extras for individual packaging will be charged when specified.

Another proposal suggests establishment of one price for unassorted primes and seconds. As in the case of packaging, where individual containers are specified applicable extras will be charged for those customers specifying primes only.

Iron Ore . . .

Iron Ore Prices, Page 123

Cleveland—Shipments of Lake Superior iron ore from upper lake ports totaled 12,190,669 tons in September, an increase of 2,730,061 tons compared with the like 1949 month, reports the Lake Superior Iron Ore Association, this city. Cumulative total for the season to Oct. 1 is 58,959,539 tons, a decrease of 7,748,030 tons from a year ago. Shipments from United States ports alone totaled 11,864,615 tons in September, making the season's total 57,550,772 tons.

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Pig Iron . . .

Pig Iron Prices, Page 118

Boston—Equalization point between Everett and Buffalo iron moves west, beyond Westfield and into New York state as result of varying price increases, $3 for New York state producers compared with $1.75 by Mystic. Delivered price, foundry iron, at Westfield from Everett is $56.43 and $58.34 from Buffalo. Basic delivered all-rail to Phillipsdale, R. I. from Troy, N. Y., is $56.93 and from Buffalo $58.54. District furnace is producing nearer to capacity and stockpile is lower; heavier releases by foundries are due to some increase in melt and built up inventories.

New York—While pig iron demand from local foundries is increasingly pressing it has not reached the point where many of these buyers are willing to pay the premiums now asked for foreign iron. Foreign offerings run around $53 to $54 f.a.s. and in some instances higher. The more extended deliveries quoted on foreign iron are having some bearing. Whereas a short time ago some foreign sellers were offering deliveries within six weeks they are now quoting up to three months.

Two leading eastern seaboard sellers have not increased prices in line with advances announced recently by some inland producers. But these two interests have little merchant tonnage to sell. Whether they will advance their prices once they are again active sellers remains to be seen.

Philadelphia — Notwithstanding shortage of domestic iron most consumers have been able to at least sustain operations, although they are having to turn to scrap in order to do so and are showing a quickening interest in foreign iron despite higher prices and more extended delivery promises.

Pittsburgh—Growing scarcity of merchant iron has forced a few of the larger consumers to cut back operations from six to five days per week. Many jobbing shops have been prevented from increasing schedules. Most foundries have been forced to supplement pig iron stocks with higher proportion of scrap in melting operations and the purchase of substantial tonnages of foreign iron. The unbalanced demand supply relationship is expected to be further accentuated over remaining months this year. Some form of formal allocation soon is expected.

Buffalo—Increased volume of pig iron is moving to railroad casting shops on voluntary priority. The rush for iron continues. Consumers accepted the recent price increase with little comment. Output holds at 100 per cent.

Cleveland—Producers are operating at capacity but merchant pig iron supplies are becoming increasingly tight. Sellers are distributing tonnage as equitably as possible among customers, quotas being based on past sales records. But the supply is falling short of needs and the castings shops are turning to other than regular suppliers for tonnage. Interest in foreign offerings is rising though, so far as can be learned, no local foundries have purchased foreign tonnage as yet. Currently, local foundries are showing interest in a brok-

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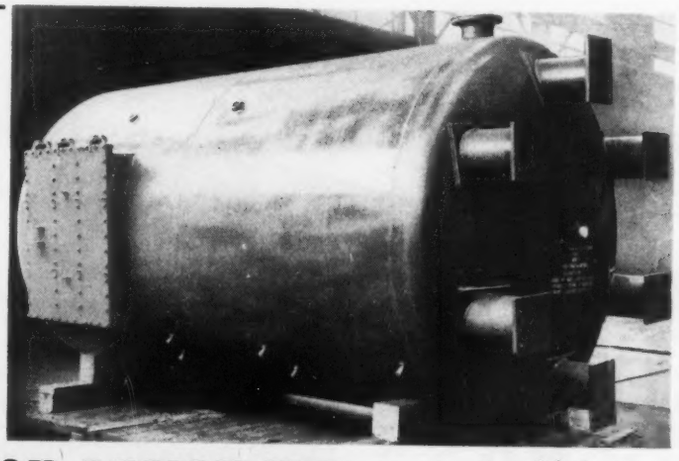

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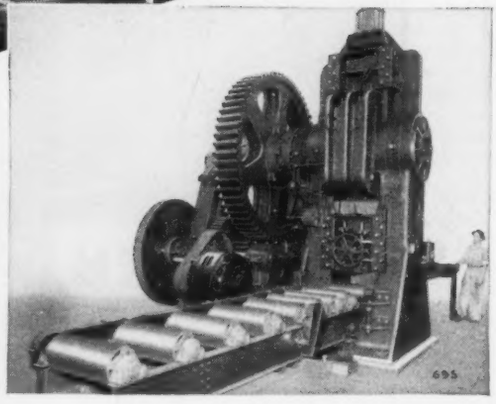

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er's offering of 10,000 tons of basic and foundry iron at the established market price plus 5 per cent. The iron is reported available from a Texas furnace, but so far nothing has come of the deal, it is said.

Cincinnati—Expansion in foundry melt is putting a strain on pig iron supplies. Most shipments are to old customers, on allocation. Interest is shown in foreign iron despite higher delivered price.

Chicago — Three dollar spread in prices continues to exist in this district. At least one producer who has not advanced prices is completely out of the market at present, stocks of merchant iron having been sold.

Wisconsin Steel Division, International Harvester Co., advanced its prices $3 per ton on pig iron, effective Sept. 29.

St. Louis—Pig iron demand is rising under stimulus of smaller jobbing foundries striving to obtain iron for 100 per cent operations.

Seattle — Foreign pig iron has firmed and is now about on a price parity with domestic. Foreign producers, mostly in the British zone of Germany, are committed to year end.

Warehouse . . .

Warehouse Prices, Page 123

Pittsburgh—Distributors' steel inventories tend downward despite screening of new orders coupled with control of shipments from stock. Warehouse interests contend suppliers are six to twelve weeks behind on completing delivery of order commitments. Mills expect to clear up this carryover tonnage during fourth quarter.

Cleveland—Distributors are meeting increasing difficulty in satisfying customers' needs. Warehouse inventories are shrinking rapidly in all product categories, outgoing shipments exceeding incoming tonnage. Supply stringency is especially acute in light, flat-rolled items and plates, but bars and structurals also are scarce, as well as wire and specialty goods. Indicative of the depleted condition of warehouse stocks, a national survey by the American Steel Warehouse Association shows that stocks of industrial steels held by warehouses are down 40 per cent since September, 1949. Inventory loss in the period is estimated at 439,920 tons, the distributors now holding 782,866 tons.

Cincinnati—Warehouse supply conditions are worsening, mill shipments failing by a wide gap to meet demands. Fabricators decline to quote on some projects. Fabricators are taking substitute material to maintain operations.

Los Angeles—Warehouse sales in September slumped 15 per cent from August peaks. With stocks at minimum levels, distributors say future sales volume depends on allocations.

San Francisco — Distributors are finding greater difficulty in obtaining products and their supplies are vanishing.

Seattle — Warehouse volume has declined, September showing about 75 per cent of August turnover. The drop is attributed to inability of sellers to meet demand. If materials were available, the August record would have been broken. Sheets and light plates are in most critical supply.

Scrap . . .

Scrap Prices, Page 126

Pittsburgh—Dealer scrap is moving to mills at formula prices, but foundries and electric furnaces are paying premiums for low phos quality bundles. Crushers' buying prices for machine shop and mixed turnings have been advanced in line with recently established higher mill buying price for short shoveling. Cast grades have advanced about $2, reflecting the pig iron shortage. Railroad items are stronger, notably rails which are up about $5. Mill stocks are in good shape. First shipment of German scrap on U. S. Steel's large commitment, amounting to 9300 tons, arrived last week.

Boston—With exception of slightly stronger prices for No. 2 heavy melting and mixed borings and turnings, quotations on steelmaking scrap are steady and unchanged. Cast grades are strong with district buying supplemented by purchases for outside eastern foundries. Latter are short of pig iron and increasing the ratio of scrap in melts.

New York—Brokers' buying prices are unchanged on the major open-hearth grades. However, offerings have been increased on machine shop turnings to $23.50-$24.50; on short shovel turnings, to $26-$27; on electric furnace bundles, to $36-$37. Cast grades are stiffer, brokers now paying $35-$36 for No. 1 cupola; $37-$38 for No. 1 machinery; $35-$36 for charging box and heavy breakable.

Philadelphia—While the $39 delivered formula price still generally applies on No. 1 heavy melting steel and No. 1 bundles, buying pressure is strong and one conversion operation involved a sale as high as $41 for a modest tonnage.

Machine shop turnings are higher at $28.50-$29, delivered; low phos punchings and plate scrap, $47; electric furnace bundles, $44; knucklers and couplers and steel car wheels, $48.

Cast scrap is strong, reflecting in part the increasing stringency in pig iron. No. 1 cupola cast is higher at $46-$47, delivered; No. 1 machinery cast, $49-$51; No. 1 yard cast, $44-$45; charging box and heavy breakable cast, $44. No. 1 wheels are higher at $52; malleable, at $58-$59.

Buffalo—Although major consumers are sticking to the voluntary price formula, sales are reported to smaller users above the stabilized levels. Shipments continue to mills within the formula. Strength rules the cast market with additional price gains of $1 to $2 posted. Mills report large reserve stockpiles despite heavy current requirements.

Cleveland—Pressure is still being applied against the "formula" pricing in scrap with the differential between No. 1 and No. 2 heavy melting narrowing. The spread between local and Youngstown prices is also smaller as an attempt is being made to make those markets equally as attractive to shippers. This was the policy maintained during the World War II period. A sharp advance was recorded in the turnings market here as brokers bought actively to cover a mill's requirements. Mixed borings and turnings, short shovel turn-

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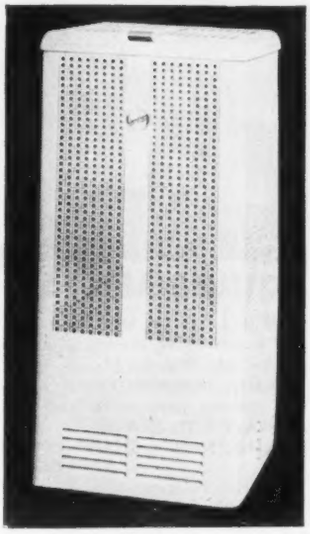

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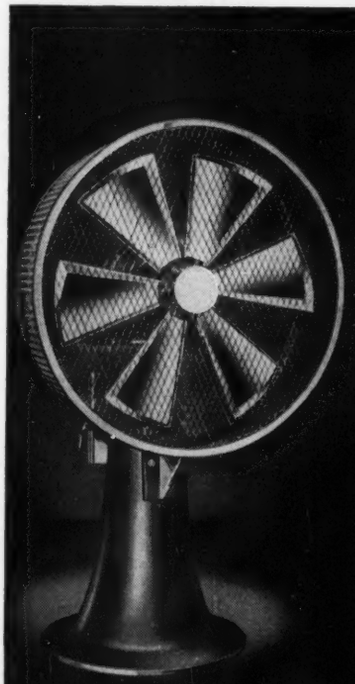

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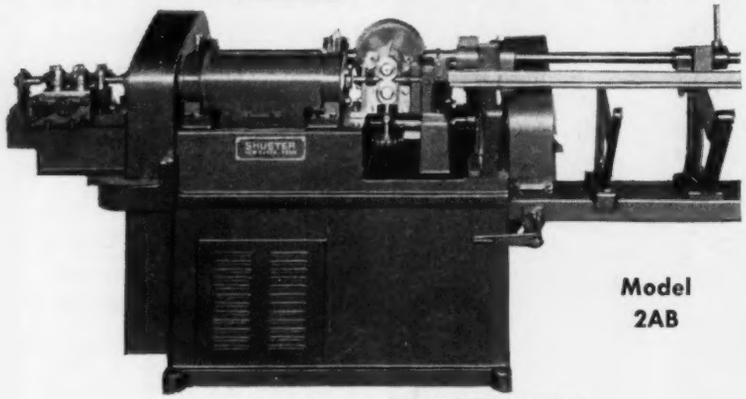


Model 2AB

Capacity: 3/16" dia. — 3/8" dia. (BASIC WIRE)

Automatic

WIRE STRAIGHTENING AND CUTTING MACHINE

This new "SHUSTER"—with its five gear-driven straightening rolls—handles even badly twisted wire with ease. Square and rectangular as well as round wire may be straightened and cut to exact lengths. Other "Shuster" features that assure high speed, quality production are: almost continuous wire travel, rapid cut-off, V-belt motor drive, ball and roller bearings, and extreme rigidity throughout. .025" to 11/16" diameters. Write for details.

Mfd. by METTLER MACHINE TOOL, INC.
132R Lawrence St. **New Haven, Conn.**
Representatives in all principal cities and foreign countries.

ings and cast iron borings are quoted $36.50-$37.

Chicago—Another tug-of-war between mills and traders is developing. Mills plan to hold to formula. Many brokers say they will not sell at those prices. Most are now being forced to pay the consumer price for the limited quantity of such material they can obtain. Of the open-hearth grades, only No. 2 bundles are available for sale at a profit. Borings and turnings are now established at $33-$34. Only machine shop turnings are bringing less. Low phos is quotable at $49-$50. Foundry grades are strong, but no general price advance is reported.

Cincinnati—Steelmaking grades are $1 higher with heavy melting steel, $43. Most cast grades are unchanged, but strong and active. Tonnage is coming out freely except in a few instances where dealers are holding on speculation.

St. Louis—Scrap market is unsually quiet. Mills are not buying and foundries are only picking up cast for pig iron replacement when it can be obtained at favorable prices. Lethargy is attributed to belief scrap price controls are a possibility for the not distant future.

San Francisco—Prices have settled down to a firm level of $26.50 a ton, delivered, for No. 1 heavy melting. However, mill demand is active and with prospects that operations will remain at capacity far into the future, prices may move higher this winter.

Seattle—Dealers report premiums over established prices for steel scrap in a temporarily run-away market, stating $3 to $3.50 over quoted prices is being paid for choice lots. Material is scarce. Bethlehem Pacific expects a cargo of European scrap early this month. Cast iron scrap is available in fair tonnages, prices ranging from $35 to $44.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 122

Cleveland—Oven coke demand exceeds production and the foundries are having a difficult time obtaining sufficient supplies to support currently enlarged operations.

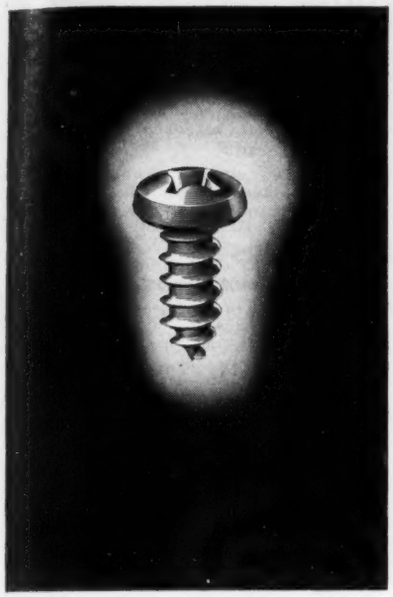
Chicago—The Milwaukee foundry coke producer advanced its price $1.25 a ton to $23 fob ovens Oct. 2.

Salt Lake City—Geneva Steel Co. will build a battery of 23 coke ovens at its Ironton plant near Provo, Utah. Contractor is Koppers Co., Inc.

Canada . . .

Toronto, Ont.—Canadian steel producers have increased prices, now quoting as follows: Carbon steel bars, $3.95; steel plate, $4.05; hot-rolled sheets, $3.85 and cold-rolled sheets, $4.60, advances of 20 cents per 100 pounds over previous levels. Galvanized sheets are marked up 25 cents to $6.65, while wire and nails are up 35 cents to $5.05 and $5.95 respectively.

A rise of $2 per gross ton is posted on pig iron, bringing the base grade, 2.25 silicon and under, to $48.50 f.o.b. Sault Ste. Marie, Ont., freight charges extra. For each .25 increase in silicon the price is up 50 cents per ton. Malleable iron is quoted $49.50 f.o.b. Sault Ste. Marie, freight extra.



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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 119

San Francisco—Demand continues strong and supplies are scarce despite capacity production.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1155 tons, four bridges and underpasses, Olneyville cutoff expressway, Providence, R. I., to Bethlehem Steel Co., Bethlehem, Pa.; M. A. Gammino Construction Co., Providence, general contractor.

850 tons, power plant, Long Island Lighting Co., Glenwood Landing, L. I., to Harris Structural Steel Co., New York.

600 tons, General Electric Co.'s tube works, Owensburg, Ky., to Bethlehem Steel Co., Bethlehem.

560 tons, repair shop, Metropolitan Transit Authority, Orient Heights, Boston, to American Bridge Co., Pittsburgh; bids direct, Sept. 18.

400 tons, plant addition, Sprout-Waldron Co., Muncie, Pa., to Bethlehem Steel Co.

387 tons, No. 51, New Jersey turnpike, Bergen county, through Union Building & Construction Co., Passaic, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

375 tons, building, Marywood College, Scranton, Pa., to Pine Brook Iron Works, that city.

365 tons, school, Elmont, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, mechanical engineering building, Penn State College, State College, Pa., to Anthracite Bridge Co., Scranton, Pa.

200 tons, Pogue river, Oregon state bridge, to Poole, McGonigle & Dick, Portland.

150 tons, telephone building, Dover, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

135 tons, station, Metropolitan Transit Authority, Orient Heights, Boston, to American Bridge Co., Pittsburgh; bids direct Sept. 18.

125 tons, conveyor and tower, Long Island Lighting Co., Long Island, to Lehigh Structural Steel Co., Allentown, Pa.

115 tons, building, Empire Brush Works, 200 William Street, Port Chester, N. Y., to Grand Iron Works Inc., New York city.

STRUCTURAL STEEL PENDING

4000 tons, continuous deck truss bridge, Merrimac river, Hunt's Falls, Mass.

1600 tons, Lankenau Private Hospital, Montgomery county, Pennsylvania; bids asked.

1200 tons, also 800 tons reinforcing, 500 tons steel piling, Washington state Cowlitz river bridge; Peter Kiewit & Sons Co., Longview, Wash., low $1,352,345.

750 tons, building, Wharton business school, University of Pennsylvania, Philadelphia; bids Nov. 1.

600 tons, Oregon state Williamette river bridge; bids in.

400 tons, addition, state hospital, Hollidaysburg, Pa.; bids Oct. 11.

360 tons, state bridge, Camden county, New Jersey; bids Oct. 17.

325 tons, alterations, Sullivan Square, Metropolitan Transit Authority, Boston; bids in.

300 tons, Oregon state 761-foot Jasper bridge; bids in.

140 tons, state bridge, West Warwick, R. I.; bids postponed to Oct. 11, Providence, R. I.

112 tons, Army warehouses in Alaska; bids in.

REINFORCING BARS . . .

REINFORCING BARS PLACED

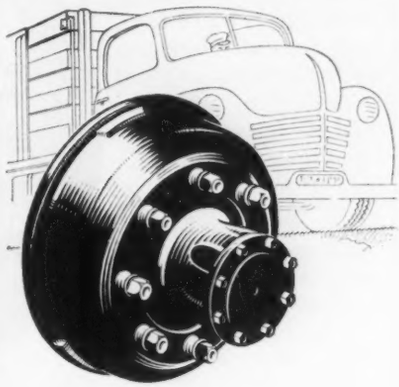
100 tons, Fort Richardson, Alaska, service club; to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, men's dormitory, Lewiston, Idaho, to Sparling Steel Co., Seattle.

100 tons, Ridpath Hotel, Spokane, to Sparling Steel Co., Seattle.

REINFORCING BARS PENDING

180 tons, piers, channel span, bridge, Charles river, Boston, Stuart & Sons Co., Watertown, Mass., low; also 11,400 tons linear feet of steel piling.



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The addition of Molybdenum to cast iron has specially applicable effects where good resistance to wear must be combined with least susceptibility to cracking under sudden changes of temperature.

Brake drums, for instance: here is a well-proved composition, 3.70% Total Carbon, 1.80% Silicon, 0.80% Manganese, with 0.50% Chromium and 0.70% Molybdenum added.

This is one of the many suitable economical compositions in our new booklet, "Applications of Molybdenum Cast Irons." The busy foundryman and engineer will find the alphabetical listing useful—write for a copy!

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No Mobile Crane made today can match **KRANE KAR** speed, safety, and economy of operation... picking up, carrying, and placing loads . . . anywhere, in plant or yard . . . uneven terrain, congested areas, low overhead, up and down ramps.

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MOVES LOADS
EASIER - FASTER -
SLASHES COST OF
MATERIALS HANDLING

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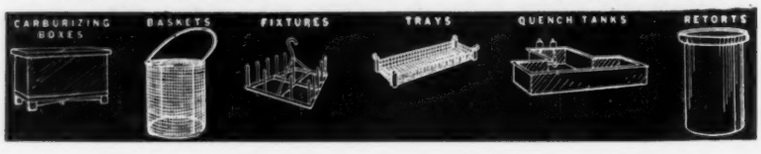


PLATES . . .

PLATES PLACED

220 tons, tank, Wichita, Kans., to Kansas City Structural Steel Co., Kansas City, Kans.

100 tons, digesters for Weyerhaeuser pulp plant, Longview, Wash., to Chicago Bridge & Iron Co., Seattle.

100 tons, two elevated storage tanks for A. E. C., Idaho Falls, Ida., to Chicago Bridge & Iron Co., Seattle, $227,000.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Southern Pacific, 40 diesel-electric locomotives, comprising twenty-two 1200-hp switchers and eighteen 1600-hp all-service engines, to Baldwin Locomotive Works, Eddystone, Pa.

RAILS PLACED

Central of New Jersey, 5800 tons of 131-lb. rail to Bethlehem Steel Co., Bethlehem, Pa.

RAILROAD CARS PLACED

Chicago, Indianapolis & Louisville, 100 fifty-ton box cars, to the General American Transportation Co., Chicago.

Chicago & Northwestern, 2000 fifty-ton box cars to Pullman-Standard Car Mfg. Co., Chicago.

French North African Railway, 6 diesel-electric locomotives, to the Baldwin Locomotive Works, Eddystone, Pa.

Great Northern, 250 seventy-ton flat bottom gondolas to American Car & Foundry Co., New York, and three 95-ton well-type flat cars to its Superior, Wis., shops.

Lancaster & Chester, 20 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Pennsylvania, 5000 freight cars, comprising 2750 gondolas, 2000 box cars and 250 flat cars, placed as follows: 1500 box cars to Pressed Steel Car Co., Chicago; 500 box cars, 250 flat cars and 250 gondolas Pennsylvania's own shops; 1200 gondolas to the American Car & Foundry Co., New York; 800 gondolas to Pullman-Standard Car Mfg. Co., Chicago; 500 gondolas to General American Transportation Co., Chicago.

Spokane, Portland & Seattle, 200 seventy-ton gondolas, to the American Car & Foundry Co., New York.

PIPE . . .

STEEL PIPE PLACED

1680 tons, 36,000 feet of 20-in. pipe, Long Island Lighting Co., Mineola, N. Y., to Armco Steel Corp., Middletown, O.

1500 tons, 48 and 54 inch steel fabricated pipe, city of Philadelphia, to Bethlehem Steel Co.

FERROALLOYS

(*Continued from page* 123)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8 MxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Low-Carbon Ferrochrome Silicon: (Cr 34.41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50% C Grade, $1.03 per lb of contained chromium,

ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 8.65c per lb of alloy, ton lots packed 10.05c, 200 to 1999 lb 10.40c, smaller lots 10.90c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lot 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained, f.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.). Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $167 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%.) Contract, $183 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered, Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.10.

Grainal: Vanadium Grainal No. 1, 93c per lb; No. 6, 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $3.50 per lb of contained Cb, less ton $3.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $2.67 per lb of contained Cb plus Ta, delivered; less ton lots $2.72.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Sileaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.0c per lb of alloy; ton lots 18.0c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

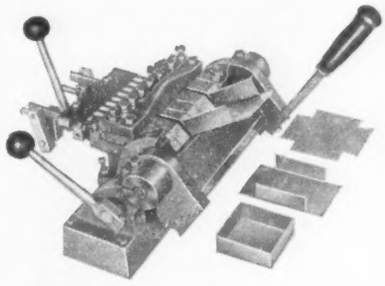
Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.22; Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth $1.04, packed in bags containing 20 lb of molybdenum; Washington, Pa., 95.00c.

New! di-acro BOX FINGER BRAKE

Four models 6" 12" 18" 24"
Capacity—16 Gauge Steel



3 TOOLS IN ONE
1 BOX and PAN BRAKE
2 STANDARD BRAKE
3 BAR FOLDER

One box or 10,000—can be economically produced with the versatile new Di-Acro Box Finger Brake.

Serves perfectly for all standard brake operations — an Acute Angle Bar converts the brake to a bar folder for locks, seams, hems and sharp angles.

The unique Di-Acro Open End Finger forms square or triangular tubes and other similar parts. The Box Finger Bar can be easily mounted on all standard Di-Acro Brakes.

See Di-Acro Exhibit BOOTH 1603
Nat'l Metal Exposition, Chicago
Oct. 23-27

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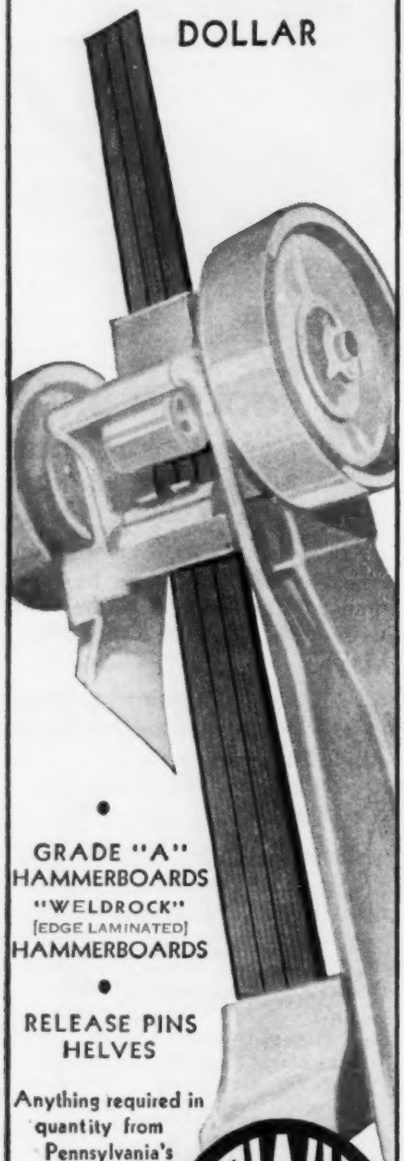

•

GRADE "A"
HAMMERBOARDS
"WELDROCK"
[EDGE LAMINATED]
HAMMERBOARDS

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RELEASE PINS
HELVES

Anything required in quantity from Pennsylvania's hard woods—maple and cherry

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Metalworking Briefs

CONSTRUCTION, ENTERPRISE
ORGANIZATIONAL CHANGES

Alabama

Sloss-Sheffield Steel & Iron Co., Birmingham, will let contracts for a battery of 30 new coke ovens to cost more than $2 million.

California

Minneapolis-Honeywell Regulator Co., Minneapolis, purchased plant, equipment and assets of the dissolved Domestic Thermostat Co., Los Angeles, which was engaged in manufacture of controls for hot water heaters.

California

Goodyear Tire & Rubber Co. of California, Goodyear Tire & Rubber Co. subsidiary, celebrated its 30th anniversary of West Coast operations. A $1 million expansion of the firm's Los Angeles plant facilities to produce Airfoam cushioning material is scheduled for completion by Jan. 1.

California

Aero Suppliers of Los Angeles Inc. started construction of a plant in Los Angeles. Facilities will increase production of aircraft parts by 30 per cent. Completion is scheduled by Nov. 1.

California

Mattel Creations Inc., Culver City, Calif., will build a $750,000 plant at the Los Angeles International Airport industrial tract. Facilities for manufacture of toys, now located at the present location in Culver City, will be moved to the new plant. Architect is S. Charles Lee. Construction will be by Hayden-Lee Corp.

California

Gilmore Air Conditioning Service is planning a new plant in San Francisco to cost about $65,000.

California

Pyromet Brazing & Heat Treating Co. was organized in San Francisco and has leased a plant in South San Francisco where electric furnaces and other heating equipment will be installed at a cost of $50,000. The new firm will do commercial furnace or copper brazing, bright brazing of stainless steel and heat treating electrical steels.

California

W. W. Sly Mfg. Co., Cleveland, appointed Horrell Co., 8006 Melrose Ave., Los Angeles, to act as sales engineer for its line of industrial dust control and sandblast equipment.

Connecticut

Dorac Corp. was established at 62 LaSalle Rd., West Hartford, Conn., as manufacturers' representative to represent manufacturers of automotive, service station, truck and transmission equipment, and manufacturers of component parts for such equipment in the New England territory. An additional phase of the activities of the Dorac Corp. is to act as purchasing agent for its subsidiary company in Venezuela, with headquarters in Caracas, and also for selected companies in the remaining Latin-American countries. Principals of the corporation are Carlos A. Dominguez, persident, and Bruce L. Rackliffe, vice president.

Delaware

King Industries Inc., automotive, aviation and machine parts, was chartered by the corporation department of the secretary of state's office at Dover, Del. Corporation Service Co., Delaware Trust Bldg., Wilmington, Del., is serving as the principal office.

Florida

Miami Structural Iron Co., 132 N.W. 12th St., Miami, Fla., plans to construct a factory, 440 N.W. 26th St. Lester Avery, Miami, is the architect.

Georgia

Pittsburgh Plate Glass Co., paint division, Pittsburgh, is receiving bids for a paint and varnishing manufacturing plant, East Point, Ga. Robert & Co. Associates, 96 Poplar St. N.W., Atlanta, is the architect-engineer.

Idaho

Atomic Energy Commission awarded a $543,931 contract to C. B. Lauch Construction Co., Boise, Idaho, for two buildings, refuse burner and other facilities, Idaho Falls, Idaho. Paul W. Larsen, Salt Lake City, Utah, is low, $362,589, for construction of a steel frame steam reactor plant.

Indiana

F. H, Langsenkamp Co., Indianapolis, was appointed distributor for O-rings manufactured by **Parker Appliance Co.,** Cleveland.

Iowa

Maquoketa Co., Maquoketa, Iowa, moved its plant to Clinton, Iowa, where a new building is under construction. Until it is completed the company temporarily will be located in the plant of Central Steel Tube Co. in Clinton.

Iowa

Firestone Tire & Rubber Co., Akron, plans construction of a $5 million tire plant at Des Moines, Iowa. Warehouse facilities will be provided and actual production is expected to start by late spring.

Kentucky

General Electric Co., Schenectady, N. Y., plans a $750,000 expansion and conversion program for its Kentucky glass works plant, Lexington, Ky. Approximately $500,000 will be spent for new equipment and $250,000 for expansion. The glass works will stop manufacturing pressed glass for Lexington lamp works and will be reconverted to output of incandescent bulbs for household use.

Louisiana

J & L Steel Barrel Co. moved its Gretna plant to Bridgedale, La.

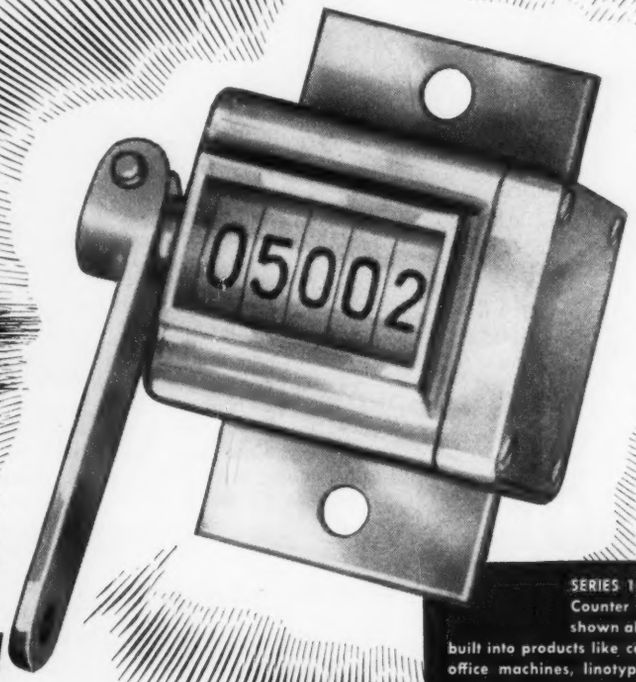
Louisiana

Commercial Solvents Corp., engineering division, Terre Haute, Ind., selected Foster-Hamilton Inc., Cincinnati, as engineer-contractor for the major portion of its $1 million plant in Sterlington, La.

Maryland

Cambridge Wire Cloth Co., Cambridge, Md., appointed these distributors for its line of gripper woven wire slings: Auto Electric & Carburetor Co. Inc., Birmingham; Engineering Factors Co., Avon, Conn.; Alfred B. King Co., New Haven, Conn., Mechanical Handling Devices, South Bend, Ind.; J. M. Farrell, New Orleans; Material Handling Equipment Co., Flushing, Mich.; Clark Materials Handling Co., Harrisburg, Pa.; Colonial Supply Co., Pittsburgh; Bittenbender Co., Scranton, Pa.; L. H.

Turn Your "DIVINING ROD" on Your Own Product



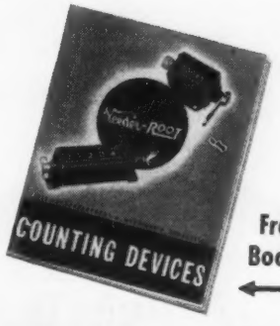
SERIES 1145 Small Square Case Counter (Rotary Ratchet type shown about twice actual size... built into products like cameras, coin machines, office machines, linotypes, postage machines, parking meters, light machine tools. One of the scores of basic types of electrical and mechanical counters shown in free 8-page "CounT-B-oK" shown below. Write for a copy.

...you may find NEW SALES welling up from a hidden COUNT-Ability

As the pioneers searched for water with an educated witch-hazel switch . . . so turn your own mathematical mind on this million-dollar question:

"Would My Product Be More Useful To My Customers . . . If It Could Count?"

Call a Veeder-Root engineer and let him help you answer that question. Then, if the answer is favorable, he will *build-in* a Veeder-Root Counter as an integral part of your product . . . to build more sales than you ever counted on before. Look up the nearest V-R office in your Classified Directory — or call the main office: Hartford 7-7204.

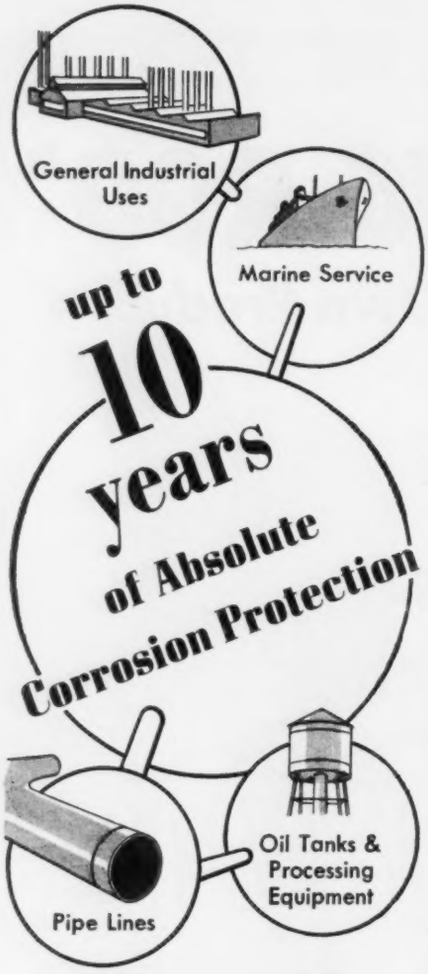


Free Book

Veeder-Root COUNTERS "Count Anything on Earth"

VEEDER-ROOT INC., HARTFORD 2, CONN.

In Canada: Veeder-Root of Canada, Ltd., 955 St. James Street, Montreal 3.
In Great Britain: Veeder-Root Ltd., Kilspindie Rd., Dundee, Scotland.



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4000
Coatings

Developed as a coating system for ship bottoms, Hysol now has been adapted for general industrial and oil field uses. Tough and abrasion-resistant, Hysol Coatings adhere firmly to any metal surface. *Write for specific information.*

- **Resist attack from salt water and practically all chemicals.**
- **8 colors.**
- **Easily applied using spray, brush, dip or roller methods.**

houghton laboratories, inc.
OLEAN, NEW YORK

Plants at Olean, N. Y. and Smethport, Pa.

Behind the Scenes . . .

Repetitive Operation

In STEEL, Oct. 14, 1940, appeared stories on the steel industry's preparedness status, scrap supplies, the excess profits tax, rearmament and machine tools, allocations and defense contracts.

In this issue, in many preceding it and probably in many to follow, the melancholy fact is that stories are amazingly similar to those a decade ago.

STEEL hates to repeat itself, but what can it do if history insists upon the repetition?

Kay Francis in the Arctic

A census count of Alaskan Eskimos has been completed. The reports reveal two George Washingtons, two Abraham Lincolns, two Daniel Websters, two Benjamin Franklins, a Woodrow Wilson and a Cleveland Truman.

Kay Francis, Gary Cooper and Clark Gable are happy members of the Eskimo peoples. Most popular name in all the Arctic is Sigwien, bestowed on no less than nine Eskimos, don't ask us why. A five-year-old boy's name is Mr. Roosevelt.

From Aa to Zyzneski

The story goes that the late John Barrymore could read a telephone directory aloud and make it sound dramatic. We don't see what's so remarkable about that. A telephone directory is dramatic in its own right.

On the first page of most of the telephone books are the fire, police and emergency calls. Scattered through many a directory are name upon name that recall dramatic or romantic associations — MacArthur, Stassen, Turner (for Lana), etc.

The above profound thoughts were running through our head the other day as we were browsing in STEEL's library of some 500 telephone directories. The editors and research people use them to check names, verify addresses and find phone numbers of persons from whom they want information in a hurry.

The directory for every big city in the U. S. and Canada—and some that aren't so big—is represented in the library. The largest book carried is the Chicago alphabetical directory with 2127 pages. The smallest is for Mulliken, Mich., with two pages. In the Mulliken directory, 178 numbers are listed. We didn't count the numbers for Chicago.

A man hard to beat out of first place in any personal name listing would be Herbert Aa whom we found heading the Brooklyn, N. Y., directory's personal names. A hard man to displace from last position would be John Zyzneski, found in the Manhattan, N. Y., directory.

Puzzle Corner

You all did beautifully on the cryptographic puzzle of Oct. 2. The promoter needed $10,652. First in with correct answer were William E. Waldron Jr. of National Tube Co.; M. S. Bailey, one of our steadier correspondents who has just informed us he's city councillor for Montreal, Canada; C. E. Blass of Talon Inc.; R. R. Rychener of National Gypsum Co.; James H. Miller of Sharon Steel Corp.; Harry Wilcox of Automatic Signal Division; Steve Schemine of Hobson Cutter Division; Fredric C. Panzer of Concord Products Corp.; and C. I. Gardner of Orinoco Mining Co.

Jake, a friend of ours, reports that the radiator of his automobile has a capacity of 4 gallons and is filled with a 30 per cent antifreeze solution. He wants to increase the antifreeze proportion to 50 per cent. How much of the 30 per cent solution must be taken out to permit a 50 per cent solution if he refills with undiluted antifreeze?

So eager are you addicts for puzzles that some of you are trying to guess the make of car we drove on our vacation when we had so much trouble. (You'll remember we mentioned the car in the Oct. 2 issue.)

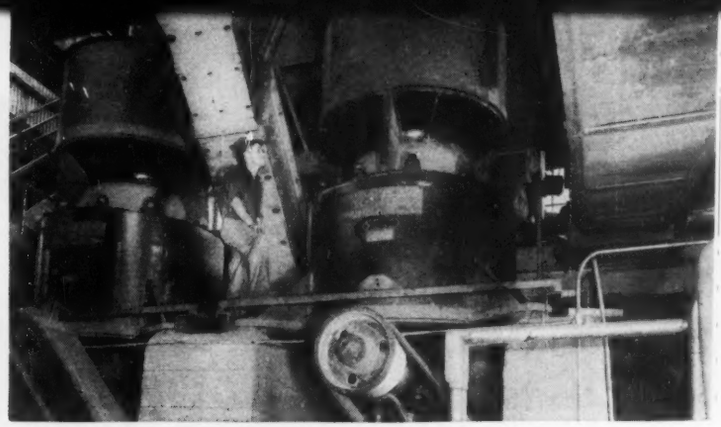
Guesses so far are for Ford, Chevrolet, Plymouth, Willys Jeep and Crosley. Nope, none of those.

Shrdlu

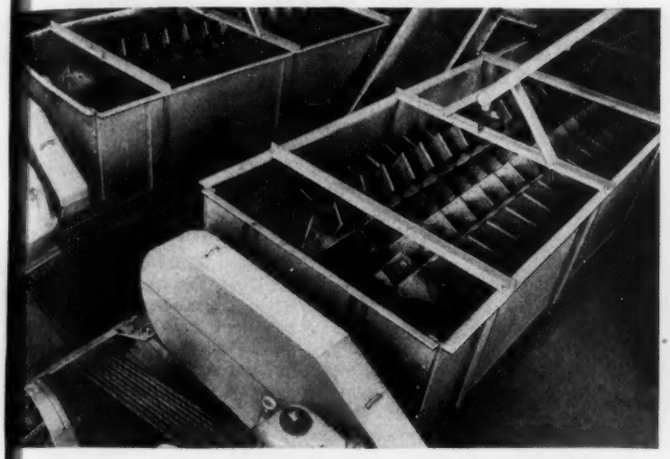
(Editorial Index—page 61)

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.

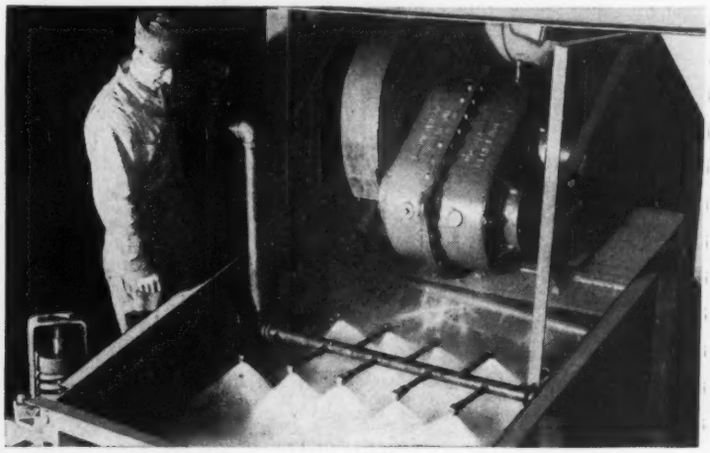
3 **TOUGH, ABRASIVE, LOW GRADE** iron ores are crushed in high output primary gyratory and jaw crushers. This 60-in. Superior-McCully crusher is in use in the Lake Superior region. Write for Bulletin 07B6004 for complete details on this type of crusher.



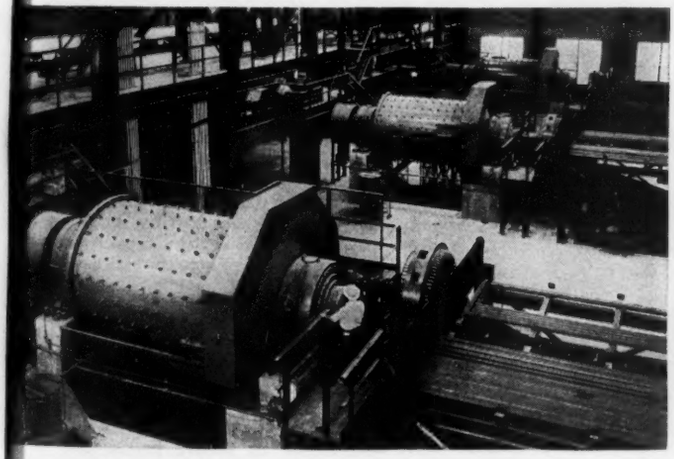
4 **FINE REDUCTION** of the iron ore is often accomplished with *Hydrocone* gyratory crushers. Two are seen working in parallel at this Adirondacks iron mine and beneficiation plant. Write for Bulletin 07B7145 for complete description and operating data.



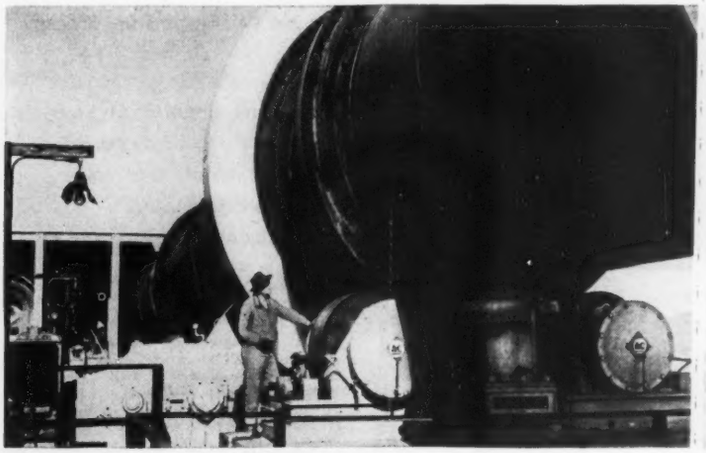
5 **THESE LOG WASHERS** are used to remove silica and medium sticky clay from crushed iron ore. Contra-rotating steel paddles produce a scuffing, scouring and sluicing action. Allis-Chalmers makes all basic types of washing equipment. See Bulletin 07B6411.



6 **IN CONCENTRATING IRON ORE** by the heavy density process, *Low-Head* vibrating screens are widely used for recovering media. The first screen section drains the media while the second section washes at this Minnesota plant. Write for Bulletin 07B6330.



7 **IRON ORE IS FINELY GROUND** in three A-C 8 ft x 12 ft rod mills ahead of magnetic separation at this Adirondack plant. A-C builds *five* separate types of grinding mills to meet varying plant requirements. Request Bulletin 07B6718 for full details.



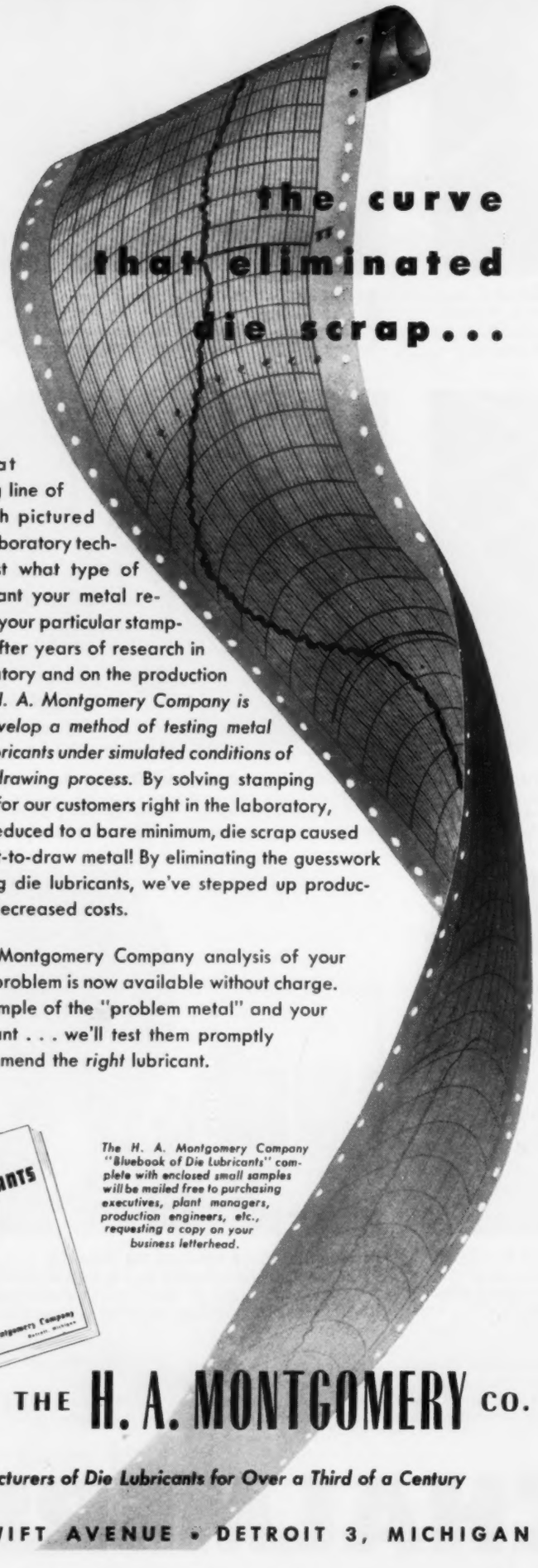
8 **NODULIZING OF BENEFICIATED IRON ORE** so that it can be used efficiently as blast furnace feed is the job of this Allis-Chalmers 11 ft, 6 in. x 300 ft rotary kiln at a southern iron mine and beneficiation plant. Bulletin 07B6368 contains full description.

EQUIPMENT FOR IRON ORE BENEFICIATION: Hoists . . . Jaw and gyratory crushers . . . Vibrating screens . . . All types of washers . . . Concentrating jigs . . . Grinding mills . . . Rotary kilns and coolers . . . Centrifugal pumps . . . *Texrope* V-Belt drives and sheaves . . . All types and sizes of Electric motors . . . Starters . . . Complete power generation, distribution, control equipment. Write for literature.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

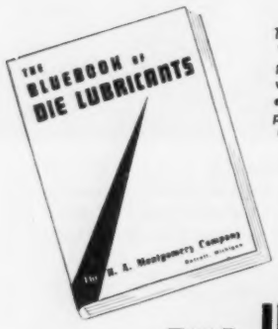
Power, Electric, Processing Equipment for Iron and Steel



the curve that eliminated die scrap...

Yes, that curving line of the graph pictured tells our laboratory technicians just what type of die lubricant your metal requires for your particular stamping job! After years of research in the laboratory and on the production line, *The H. A. Montgomery Company is first to develop a method of testing metal and die lubricants under simulated conditions of the deep-drawing process.* By solving stamping problems for our customers right in the laboratory, we have reduced to a bare minimum, die scrap caused by difficult-to-draw metal! By eliminating the guesswork in selecting die lubricants, we've stepped up production and decreased costs.

An H. A. Montgomery Company analysis of your stamping problem is now available without charge. Send a sample of the "problem metal" and your die lubricant . . . we'll test them promptly and recommend the *right* lubricant.



The H. A. Montgomery Company "Bluebook of Die Lubricants" complete with enclosed small samples will be mailed free to purchasing executives, plant managers, production engineers, etc., requesting a copy on your business letterhead.

THE H. A. MONTGOMERY CO.

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LETTERS
TO THE EDITORS

You and Machine Won't Snarl

In your Oct. 2nd issue of STEEL, page 81, is an article on "Snarl Guards Do the Job", wherein it is stated that at the plant of Gilbert & Bennett Mfg. Co., Georgetown, Conn., each fine wire drawing machine is equipped with a snarl safety switch that stops its motor if the wire snarls as it comes from the supply tub.

We are very much interested in this "switch" or "guard". Could you forward information to the undersigned and to Mr. George Bell, our master mechanic?

Paul W. Dillon, President
Northwestern Steel & Wire Co., Sterling, Ill.

• *Additional information is available from Clark Controller Co., 1146 E. 152nd St., Cleveland 10, O., manufacturer of the devices.*

Information Shortage, Too

Feb. 23, 1948, issue of STEEL published an eight-page section, "Special Report on the Sheet and Strip Shortage". This contained a great deal of information with reference to production of sheets and strip in the United States. Since that time there have been a number of changes in capacity and in ownership of some of the producing facilities. Has this report been re-issued?

M. H. Keating, Vice President
Hudson Mfg. Co., Chicago, Ill.

• *Report you mention is the latest available. You might obtain the information you desire in STEEL's market price section, beginning this week on page 193. A newer and more complete products directory is forthcoming.*

Midget Maker

In the July 31 issue of STEEL, on page 82, you have a short article entitled, "Small, but Packs a Wallop!", wherein you describe a powerful, but small and light storage battery manufactured by Yardney Electric Corp., New York. I would appreciate the address of the company.

Michael Lechkun
Lechkun Electric Co., Detroit, Mich.

• *Yardney Electric Corp., 105 Chambers St., New York 7, N. Y.*

Answers in Terne

We would like to secure production statistics for terne sheet or terne plate in both sheet and strip form, covering the latest period for which it may be available.

D. R. Carpenter
Ball & Black Supply Co., Los Angeles, Calif.

• *American Iron & Steel Institute combines terne plate and hot-dipped tin plate figures in its monthly report. In July, 1950, the industry shipped 168,042 net tons of the two products, making the seven-month total 1,079,265 net tons. July total represents 3 per cent of all finished steel shipped. Yearly figures are broken down for the two products; 1949 saw 81,968 net tons of terne plate and 1,659,933 net tons of hot-dipped tin plate produced.*

Hydraulic piston for landing gear; 1400 lbs; 22" x 36" x 72"
Equalizer beam; 555 lbs; 21" x 30" x 73"
Commutator spider; 1030 lbs; 24" x 47" x 47"
Connecting rod; 710 lbs; 21" x 30" x 73"

Stamina in dies

Made from steel developed by Finkl, these quenched and tempered die blocks are ready to hammer away at production records. The blocks are water quenched which develops deep hardness penetration characteristics with uniformity of hardness at each level. Such treatment also promotes good machinability, toughness, ductility, and the blocks are highly resistant to checking and washing and free from temper brittleness.

Should your die needs require high resistance to abrasion, high hardness ratings, or if you are confronted with any difficulties in forming ferrous or non-ferrous metals, Finkl has a die block for your application, and a service engineer to help with your problems.

For over 70 years Finkl has produced quality products. This experience and knowledge is available to you in planning your forging production. Call or write any of the offices listed below.

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250 Bent Street, Cambridge 41, Mass.

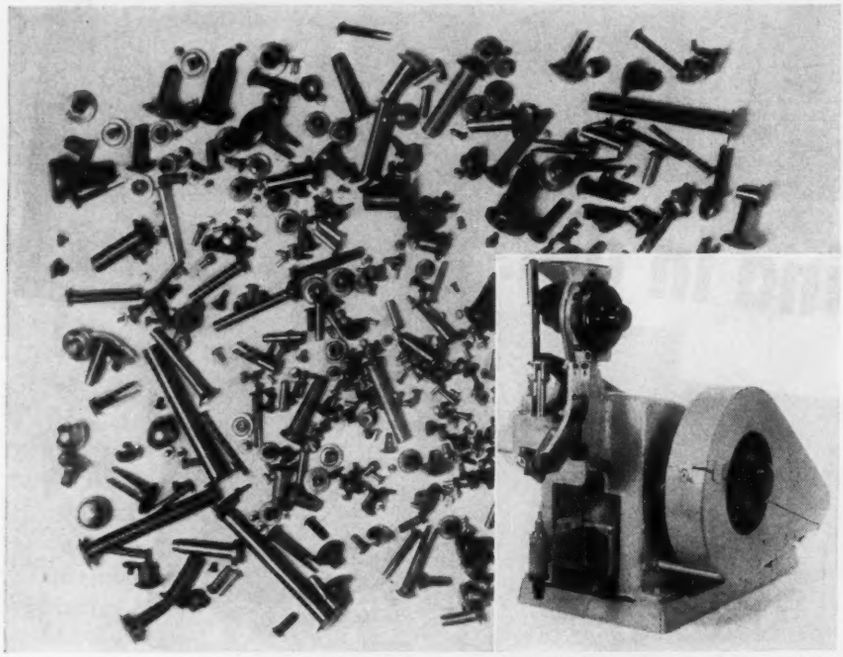
Western Warehouse
FINKL STEEL PRODS. OF CALIF.
4908 Santa Monica Blvd., Los Angeles 27, Calif.

Detroit, Michigan ★ Cleveland, Ohio ★ Pittsburgh, Penna. ★ Louisville, Ky. ★ St. Paul, Minn. ★ Houston, Texas ★ Birmingham, Ala. ★ San Francisco, Calif.

COPPER ALLOY BULLETIN

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared Each Month by BRIDGEPORT BRASS COMPANY "Bridgeport" *Headquarters for BRASS, BRONZE and COPPER*



Tubular and bifurcated rivets from 1/16" to 2¼" long are assembled by special automatic machines —Courtesy The Milford Rivet & Machine Co., Milford, Conn.

"Sewing" Metals with Rivets

Many Ductile Copper-Base Alloys Available

The development of tubular rivets and rivet-setting machines for high speed assembly has made riveting an important basic, modern assembly tool for quickly and permanently fastening metals, plastics, and soft goods.

The tubular rivet contains a hollow shank, usually extruded when shallow, and drilled when deep. When the rivet setting machine is tripped, the rivets drop into a guide from a revolving hopper, and are automatically set one or more at a time into the prepared holes of the parts to be riveted. The pin of the setting tool recedes, leading the rivet through the work. At the bottom of its travel, the pin, in conjunction with the anvil form, clinches the rivet, making a strong, permanent joint.

Since many applications present a special problem, rivets are "engineered" as to design, shape of head, dimensions, kind of metal, etc. Many have special heads for ornamental purposes or with stamped identification marks.

Rivets also function as electrical contacts, and for joining mechanically the components of electrical systems instead of soldering. Applications are almost endless ranging from novelties through die-cast assemblies, refrigerators, pen and pencil clips, eye glass frames, electrical contacts; for fastening brake linings, attaching handles to pots and pans; hinges to boxes, assembling components of television and radio instruments, etc.

The bifurcated rivet is widely used for attaching soft goods such as leather, fabrics, plastics and wood. The shank is split by sawing or punching a slot at the base. Special automatic machines are used as in the tubular applications. However, in most instances the bifurcated rivets pierce the material and the prongs are then clinched, making a strong joint.

Rivet Wire Has Special Properties

Rivet wire must be accurate in gauge, free from scratches, folds, blisters and other imperfections, and malleable to fill out the die.

Bridgeport has developed a number of alloys with special physical and chemical properties suitable for cold heading:

Yellow Brass 16 (approx. 65% copper, 35% zinc). Most popular of the heading wire alloys. Very malleable. High electrical conductivity used for electrical contacts and circuits.

Light Leaded Brass 43 (approx. 65% copper, 0.3% lead, balance zinc). Recommended for light machining and drilling.

70-30 Brass 37 (approx. 70% copper, 30% zinc). Slightly more ductile than yellow brass. Recommended for exceptionally large heads.

Low Brass 5 (approx. 80% copper, 20% zinc). Light golden color. Very ductile. Used for jewelry.

Rich Low Brass 85 (approx. 85% copper, 15% zinc). Fine golden color —for lipstick holders and vanities, and ornamental jewelry, pen and pencil clips.

Commercial Bronze 25 (approx. 90% copper, 10% zinc). Bronze color, resists season cracking.

Silicon Bronze 609 (approx. 98% copper, 2% silicon). Recommended for strength, ductility and for outdoor use. Resists season cracking.

Phono-Electric 840 (approx. 98.6% copper, 1.4% tin). Electrical conductivity about 40% that of copper, very malleable, stronger than copper.

Phono-Electric 985 (approx. 99.25% copper, and 0.75% cadmium). Electrical conductivity about 85% that of copper — stronger and tougher than copper.

Temper of Wire

The temper of drawn wire is indicated either in percent reduction or B&S hardness numbers.

Temper	Nominal Reduction B&S Gauge Nos.	Percent Reduction in Cross-Sectional Area
Eighth hard	½	10.9%
Quarter hard	1	20.7%
Half hard	2	37.1%
Three-quarter hard	3	50.0%
Hard	4	60.5%
Extra Hard	6	75.0%
Spring	8	84.4%

Rivet temper is generally supplied between 8% to 20% reduction in cross-sectional area; machine screw temper between 10% and 20%; wood screw temper between 15% and 37%.

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, research chemist of the Bridgeport Brass Company.

Prevention of Corrosion in Storage

Electrodeposited coatings of tin on copper and brass are widely used in storage particularly where the atmosphere may contain carbon dioxide and certain organic vapors coming from packaging materials such as paper, wood, etc. The thickness of these tin coatings may, for this purpose, be as low as .000015" or less. The common matte finish of such coatings may be brightened (greatly increased reflectivity) by momentarily heating. This heating also leads to slight alloying with the base metal.

These tin coatings are often used to speed up soldering of small complicated copper, brass and bronze parts at assembly by elimination of "tinning" during the soldering operation.

The very thin (0.00001" thick) replacement (displacement) coatings of tin from tin salt solutions on copper and copper-base alloys also give appreciable protection against tarnishing in storage and indoor atmospheres. Heavier replacement coatings may be obtained by immersion in molten salt mixtures containing tin. Tarnish resistant tin alloy coatings can also be obtained by exposure to an atmosphere of hydrogen containing volatilized stannous chloride.

Still heavier coatings of tin are obtained by dipping of properly cleaned copper and brass articles in molten tin. These coatings range from 0.0005" to .001" in thickness. The use of rollers or wipers reduces the thickness of the tin to about 0.00005" and .0001". In this process a copper-tin alloy layer is formed with the copper or copper-alloy with the outer surface essentially pure tin. This layer of alloy is usually cathodic to copper and under some conditions may lead to deep corrosion pitting of the base metal through pores in the coating.

For the most tarnish and corrosion resistant coatings the copper surfaces must be properly prepared prior to tinning.(1)(2).

(1) W. D. Jones, J. Inst. Metals, 58, 193-198 (1936).
(2) P. W. Seddon, Metal Industry, 62, 37-38 (Jan. 15, 1943).

Brass and Copper Increase Life of Vent Valve

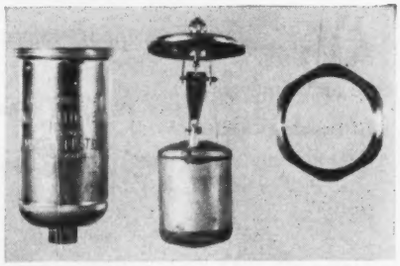
Corrosion resistance and high workability has made copper, brass and bronze almost the universal metals for water and steam applications and controls.

The body of the illustrated valve, designed to relieve trapped air from hot water heating systems, convector radiators, tanks, etc., is a drawn shell of 70-30 brass (70% copper and 30% zinc). The top sealing cover is formed from the same alloy. A threaded ring and connector is soldered to the drawn shell. Both are made from hex rod (free machining 61% copper, 3.4% lead and remainder zinc). The marking and knurling on shell are produced by rolling operations.

The float is a drawn copper shell and cap which are soldered together. The bottom of the shell and cap are corrugated for strength. Copper's excellent workability and ease of soldering, as well as its high corrosion resistance, makes the float long lasting.

The stud attached to the cap of the float is first turned, then milled and drilled from free machining rod. The same is true for the shouldered nipple which takes the valve core. The bracket and lever arm are stamped and formed from 70-30 also. The nickel-plated protective cap for the valve is cartridge brass, and is drawn, knurled and formed in an eyelet machine.

Experience over many years indicates that brass and copper give excellent service when in contact with water and steam. This explains why copper and its alloys are so widely used for the manufacture of pipe and tubing, plumbers' brass goods, radiator air valves, and the many controls used for plumbing, heating, air conditioning and refrigeration systems.



Construction of automatic venting valve for hot water heating systems, convector radiators, tanks, etc.—Courtesy Maid-O-Mist, Inc., Chicago, Illinois.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items have been tested or are endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Taper Checking Fixture is said to simplify inspection of tapers eliminating complex set-ups using a comparator, sine bar or spaced roll. A combination of angle blocks is mounted with work on the device and an indicator reading is taken. It takes less than two minutes and taper can be checked to within 0.000020" in 4". **No. 1091**

Press Tools of metal and rubber are designed for forming ferrous and nonferrous metals and also for shearing by addition of suitable undercuts in the punch and the blank-holder. Embossing can also be done by suitable engraving or machining of the punch and plate. **No. 1092**

Drilling Fixture takes round, square, hexagonal and flat work pieces and can be adjusted axially or radially to drill holes at desired location. Capacity for cylindrical work is to 1¾" in diameter. **No. 1093**

Self-Pressurizing Torch uses new petroleum fuel supplied in valve-equipped containers that hold sufficient fuel for four hours. Torch assembly can be used for soldering, burning and heating operations, producing a flame to temperature of 2,200° F. **No. 1094**

Material Calculator reads the cumulative weight for a thousand pieces of raw material required for a given work piece. It covers aluminum, brass, bronze, copper and steel in square, hexagon and round stock from ⅛" to 3" in diameter or equivalent dimension, and flat stock from .003" to 3" in thickness. **No. 1095**

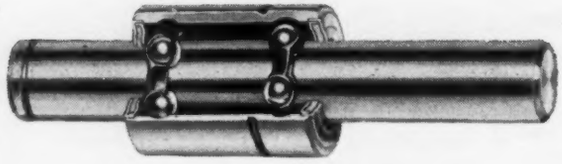
Roll-Type Marking Tool for lathes or screw machines rotates with the work, impressing the markings, until a relieved section is reached at end of line of characters, when roll automatically returns to starting position. **No. 1096**

Hollow Spindle Automatic Lathe carries cam actuated collets rating work to 1¼" diameter. Each spindle is driven by its own motor. A third small motor drives a vertical camshaft at which the cycle control is centered. Work feeds from a magazine at the rear to pass through the spindles, or from a magazine at the front. Operations include chamfering, necking, internal edge breaking, forming, grooving, shaping. **No. 1097**

Internal Gage consists of a pair of actuating fingers and a standard dial indicator to check diameters of grooves for rings of various sizes. The gage reads actual dimensions in thousandths between ½ and 6" or the plus or minus deviation in ten thousandths from a set diameter. **No. 1098**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL
"Bridgeport" BRASS
BRIDGEPORT BRASS
BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865
Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal
Warehouse Service with Slitting Facilities in Principal Cities
Advertisement

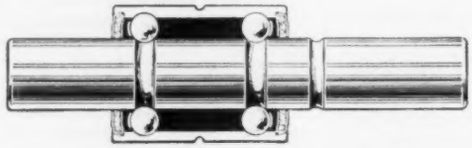
This versatile ball bearing



may cut assembly and materials costs in your application, too

If you are using prelubricated, sealed bearings with shafts that require flats, keyways, threads or multiple diameters—and your loads fall within the limits shown in the table—you will find many advantages in using a Federal Shafted Ball Bearing.

Take a good look at its compact design: Two rows of balls—equal in capacity to two single-row bearings—are held in a *single outer ring*. The *shaft itself* is the inner ring, and can be furnished with flats, keyways, threads or multiple diameters. Effective felt seals keep the grease permanently *in* and the dirt *out*.



RADIAL LOAD RATINGS IN POUNDS								
R.P.M.	500	600	800	1000	1500	2000	3000	5000
	630	600	550	510	450	415	365	315

Pure thrust may be taken as 20% of radial capacity.

Manufacturers have put these design features to work in a variety of applications—eliminated the expense and time required for boring parallel housings for the two bearings and manufacturing separate shafts. For example:

In home workshop equipment, this single unit, pressed in a die-cast housing, produced a more compact, streamlined product at lower cost. Complicated bearing housings and shaft production were eliminated.

Assembly of idler pulleys was simplified with a formed steel pulley pressed on the outer ring and mounted on the shaft in the machine frame.

In a space ventilating and heating unit, a single shafted bearing replaced two bearings and a shaft.

Federal engineers will be glad to help you adapt this versatile bearing and design a shaft for your individual needs.

Our 260-page catalog "K" gives complete specifications for these and all other bearings in the *complete* Federal line. More than 100 pages of engineering data contain load-rating tables to help you select the right bearing for every anti-friction need. Write for catalog today. Also write for a copy of our latest Ball Bearing Conversion Tables which contain complete up-to-date interchange information.

THE FEDERAL BEARINGS CO., INC., POUGHKEEPSIE, NEW YORK

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Quality since 1908

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